The Mining Journal

RAILWAY AND COMMERCIAL GAZETTE

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

[*The* MINING JOURNAL *is Registered at the General Post Office as a Newspaper, and for Transmission Abroad.*]

No. 2168.—VOL. XLVII. LONDON, SATURDAY, MARCH 10, 1877. [WITH SUPPLEMENT. PRICE ..... SIXPENCE. PER ANNUM, BY POST, £1 6s.

Royal School of Mines.

LECTURES ON MINERALOGY—No. IV.

[BY OUR SPECIAL REPORTER.]

The subject of Prof. SMYTH'S fourth lecture was the "ORES OF COPPER." In selecting the ores of copper we are dealing with substances which have given to man for thousands of years past one of the metals which he has found among the most important. If we regard the history of copper from a mineralogical point of view, we shall be inclined to enquire what was the particular ore from which mankind in that first dawn of civilisation obtained the metal. In the sacred writings we are told that Tubal Cain (probably a representative man) was the first person to turn to account copper and sundry other metals, and the question arises from whence Tubal Cain in his inland district derived his materials. From other writings also we are led to believe that copper was one of the first of the metals which man employed. If we visit a copper mining district at the present day we shall usually see the ores obtained from great depths, under considerable difficulties from water and bad air, and presenting an appearance very unlike the metal itself. We should scarcely expect, therefore, that it was from any such substances that copper was first obtained. There is, however, in old workings some difficulty about the meaning of the terms used; the Greeks used the word "chalcos," and in some places it seems to mean copper, in others it more probably refers to an alloy containing copper. Similarly the Romans had a word "aes," which sometimes meant copper and sometimes an alloy of copper and tin, to which we now give the name "gun-metal." Or this alloy a large proportion of ancient coins were made. Most probably copper was originally obtained from supplies of the native metal. This native or metallic copper occurs in some instances beautifully crystallised, in forms belonging to the cubic system, either in cubes or octahedrons, and with a tendency for a number of these crystals to join themselves together into long branches or strings. Copper occurs in this condition at the Lizard Point, in Cornwall, in connection with the rock called serpentine; but although large masses have been found (of which the finest was presented to the Geological Museum by the last company), it has not there given rise to profitable workings. This is one of the places where it is not improbable that copper might have been obtained from the surface of the ground; and it may easily be imagined how a savage might discover that a piece of such a substance could be beaten out by means of a stone, and shaped into useful articles, and by a few further experiments might even ascertain that it could be melted and cast. Hence it is that we find in the graves, &c., of the early people of this and other countries various articles fashioned out of pure copper. There are some other districts which may have furnished our early ancestors with metallic copper at or near the surface, but the lecturer did not think they were many; and after visiting a large proportion of the copper mines of Great Britain, as well as many on the Continent, and some in Asia, he must confess that he was at a loss to understand how the original civilisers of mankind were able to obtain such large quantities of copper as we know they possessed, both from descriptions and from the remains in their tombs. In the Urals and in Siberia the inhabitants who lived there hundreds or thousands of years ago seem to have reached a much higher civilisation than the present nomadic inhabitants, and to have especially practised the art of mining; and in some cases their graves have been found full of weapons, offensive and defensive, and all made of copper. Numerous of their old workings exist, seeming to show that a great deal of native copper was obtained near the surface, but that in depth it gave way to other materials, which were much more difficult to deal with in order to obtain copper from them.

The district of Lake Superior, in North America, especially on the side of the United States, is a remarkable one for the production of immense quantities of native copper; and it is also remarkable as being the only case we have in the world, at the present time, where this native copper is found both at the surface and continuing to a great depth into the ground. Large masses have been followed downwards which would weigh 40 or 50 tons in one single piece. At first the workings threatened to be unsuccessful, as long as the tough material was attempted to be obtained by the pick or by blasting; but the simple method of cutting it with with hammer and chisel has rendered the works a very great success. Curiously enough, in this district also we have traces of an ancient civilisation which has passed away, and which even preceded the time of the Red Indians (who, as far as we know, use no copper implements, for example), and there is tolerably clear evidence of mines having been worked in those ancient days. There are certain crater-like openings—the remains of shafts—and waste heaps on which trees of several hundred years growth now stand. Moreover, in these cavities curious stone hammers are found, and other sharper tools, which were probably employed as wedges. And on some of the hills in Cardiganshire and Montgomeryshire, in our own island, remains of very old workings for lead occur, in and among the rubbish heaps of which worn stone hammers are found, so like those previously mentioned that it would be difficult to distinguish between them. And in the Kilkenny district, in Ireland, certain rounded stones of a very similar character have been discovered in connection with excavations by a very ancient people.

Native copper is very readily attacked and destroyed by certain chemical agents; rain water, for example, holding carbonic and other acids in solution, will act on the copper, dissolve it, and carry it away. And thus it may have existed at the surface at one time in many districts where it does not now so exist. It may thus be carried away into the streams, or else be carried down to fresh depths, and there deposited in another form. In many mining localities these products are met with, showing that this decomposition and recomposition has been taking place. One form in which it is met with in water is that of the sulphate of copper. Sir Isaac Newton, in some of his papers, speaks of having read of a certain mine in Hungary (Herrengrund), at the foot of the Carpathians, where if you put a piece of iron into the water it was changed into copper. This statement of the great philosopher has been ridiculed of late years, but without reason, for the fact of copper being substituted for iron is perfectly true. The correct statement in the language of our times is that the iron is dissolved by the water, and in its place there is deposited a chemically equivalent quantity of copper. Large quantities of copper are obtained from two British localities by this very (cementation) process, the localities being Anglesea and the county of Wicklow. In these places water which has percolated through large masses of poor copper ore has carried away so much copper in solution that on being brought to the surface it is collected in wooden troughs, and led over pieces of scrap iron, which is gradually dissolved, and its place taken by pure spongy copper.

Next to native copper in richness of the metal comes the ore known as "ruby copper," so called from its crystals (when it occurs crystallised), exhibiting a beautiful ruby-red tint when the light falls on them in a proper direction, otherwise they have a very metallic appearance. It is a compound of two equivalents of copper and one of oxygen, and contains 88·9 per cent. of metallic copper, sometimes it occurs more disguised, having a much more earthy appearance, and the lecturer had sometimes seen it employed for road mending, in ignorance of its great value.

There is another oxide of copper—the "black oxide"—which consists of one equivalent of copper to one of oxygen, and consequently is not so rich as the last, but is still a rich ore, and is carefully preserved, so that the rain may not carry it away, since it usually occurs in the form of a powder.

Next follows a substance known as "copper glance," or "Redruthite," as well as other names. It is a sulphide of copper, and occurs crystallised in the prismatic system. No district in the world has produced such beautiful crystallised specimens as the Cornish mines. It is of a dark-grey colour, brittle, but rather soft, so that it can be cut with a knife. It is sometimes called "vitreous copper ore," because the crystals when broken across show a fracture looking much like a piece of glass. It is a very rich ore, containing 79·8 per cent. of copper. These ores are not of frequent occurrence, or very abundant; the most important places are the extreme South-West of Cornwall, near the town of Redruth, in Tuscany, and in the South-East of Hungary.

Next we come to an ore which for a long time was obtained in very limited quantities, and applied in great part to ornamental purposes, but of late years large quantities have been brought from Australia and other countries, and it is now recognised as a very valuable ore of copper. This is known by the name of "malachite." It is a compound of carbonic acid with oxide of copper, together with a portion of water: it contains about 57 per cent. of copper. It is more apt to occur at the surface than any of the above ores of copper, and for this reason in many places it has been in a great measure worked away. It occurs in the South-West of Ireland (where it may be seen in places forming large stains on the cliffs, leading some to suppose that large masses of the ore exist there), in Cornwall, North Wales, Hungary, and the Urals; but the mines of Australia, and notably the Burra Burra Mines, yield the largest quantities of it. Livingstone showed that it also exists in parts of Africa. A mineral of very similar composition is known as the "azurite," from the beautiful blue colour of its crystals: it is a carbonate of copper, and has been formed under much the same circumstances as malachite. In the middle ages some of the painters used it instead of ultramarine, but it is apt in the course of time to become green. The effect of a picture with a sky painted blue with this substance, and then in time undergoing this change, can well be imagined.

Another ore of copper is known as "purple copper ore," or "Erubescite;" but the most abundant copper ore, and the most important by far to us in Great Britain, is that called "copper pyrites." It is a brassy yellow looking substance, moderately hard, but capable of being scratched with a knife. In its purest condition it contains only a little over 34 per cent. of copper. In some cases it forms masses of from 1 ft. to 18 ft. in width, more or less mingled with quartz; and in one remarkable case—that of the Great Devon Consols Mine—it occurred like a vertical wall, worth extracting to a width of 30 ft. It is never found nearer the surface than from 60 ft. to 200 ft. Although the veins go up to the surface they contain no copper, and yet we are led to believe that it did once exist there, but has been carried away in solution, owing to a natural process of decomposition. As an example of this decomposition, the lecturer referred to a case in Cornwall where profitable malachite workings were carried on in the sand of the seashore, the malachite having been deposited in a stalactitic form in this calcareous sand from water which had percolated through old waste heaps containing much copper pyrites.

In conclusion, the lecturer referred to the remarkable change which in recent years has come over our copper trade. For something like 160 years Great Britain has been at the head of the copper-producing countries of the world, and had, in fact, commanded the copper markets. The extraordinary discoveries in Anglesea and at Ecton, in Staffordshire, about 1780, almost spoiled the copper trade of the entire world, so enormous were the quantities produced by these two districts. In 1800 the value of the copper ores raised in Devon and Cornwall was 490,000*l.*; in 1820 it had risen to 600,000*l.*; there was a gradual increase, till about 1860 the value was more than 1,500,000*l.* Suddenly there was a great fall to 700,000*l.* in 1865, and in 1875 to less than half that amount.

Lectures on Practical Mining in Germany.

CLAUSTHAL MINING SCHOOL NOTES—No. XV.*

BY J. CLARK JEFFERSON, A.R.S.M., WH. SC.,
Certificated Mining Engineer.
(Formerly Student at the Royal Bergakademie, Clausthal).

SECTION II.

PROSPECTING FOR MINERALS—BORING.

I.—PRELIMINARY PRECAUTIONS AND ARRANGEMENTS.

A.—Precautions and arrangements for preserving a vertical direction during boring.

During the commencement of boring, above all, care must be taken to keep the hole in a vertical direction. If in the commencement a bore-hole is kept truly vertical there will be but little difficulty in preserving the vertical direction to any desired depth. The most usual arrangement is that of guides or a guiding tube, which are fixed at the bottom of the bore-shaft.

1.—BORE-SHAFT: When there exists already a costeaning pit of several fathoms in depth this may be used as a bore-shaft. Such a shaft is generally rectangular in section, and divided into two partitions, one for the raising of the earth, &c., and the other for the miners.

In order to occasion as few alterations as possible the position of the hole to be bored is usually in the centre of the division used for the conveyance of the earth, &c., to the surface. If the section of the shaft is very considerable the centre of the bore-hole is brought until it is somewhat more than 3 ft. from the shorter side of the partition. Is the shaft of smaller dimensions it must be enlarged until on each of two opposite sides a segment (50°) of a circle of 3 ft. in radius can be described. The object of this is to have sufficient room for fixing the guides and turning the long keys, which are used for screwing and unscrewing the rods.

In order to determine the centre of the bore-hole at the bottom of the shaft a plank is fixed across the uppermost frame (or crib) of the bore-shaft, two pieces of string are stretched diagonally from the four corners of the partition, and at their intersection a small hole is bored through the plank, and through which the string of a plummet is passed, the lower end of the plummet fixing the position of the bore-hole at the bottom of the shaft.

When it is necessary purposely to sink a bore-shaft, the following considerations are of importance in choosing the situation of the shaft. The surface area will depend on the size and depth of the intended bore-hole. If possible it should be near a good road, and in the neighbourhood of the nearest village, and not in low-lying ground, where it might be subjected to floods; this latter precaution is of great importance when searching for beds of rock salt. If there are any streams in the neighbourhood which can be used for driving the machinery, so much the better. The character of the surface ground or strata should also be taken into account, as on this mainly will depend the cost of the shaft.

The cross section of the shaft is usually from 6 to 7 ft. square inside the timbering. The shaft is timbered in the usual manner, and the earth which is obtained in excavating the shaft is used for levelling the floor of the bore-house, which, as we shall afterwards see, is necessary for straightening the rods.

A deep shaft is of great use for the latter operations; the staging, which would otherwise be necessary, is avoided, and, besides, it could never be made so steady against the constant vibrations to which it is subjected, as the guides, &c., which are fixed inside the shaft. Beside, in winter the shaft is much warmer, and also the iron rods and tools which the miners are constantly using can be kept warm, which is of considerable advantage to the miners.

The sinking of the bore-shaft is usually carried on considerably in advance of the other works—so that in case of great obstacles a new place of operations might be selected without too great a sacrifice of time and money; and then first when the strata promise to be suitable to commence the erection of the staging, guides, bore-house, &c. The shaft is generally continued 2 ft. or 3 ft. after water has been met with, so as to have a ready and plentiful supply, which is necessary for the operations. The shaft sump should be in sufficiently strong strata for inserting and fixing the bore-tube. If the strata in the lower part of the shaft are too hard and expensive to work, or quicksand, &c., is met with (unless it be not too deep and the underlying strata suitable) then the staging must be extended for some height above the surface of the ground. In the latter case the sinking of the shaft through the quicksand will be expensive, and, if it is of any thickness, there may be some difficulty in fixing the guides and bore-tube, so that they shall remain perfectly vertical.

The length of a set of boring-rods may be made dependent on the depth of the shaft, or the depth of the latter on the length of a set. The depth in the latter case must not be less than the length of a set of rods, *plus* the length of the guiding bore-tube. The deeper the bore-shaft the greater is the length of a set of rods, and, consequently, less time will be spent in screwing and unscrewing the rods, which is of very considerable advantage with deep bore-holes.

2.—The guiding bore-tube is usually made of wood, and for ordinary sized bore-holes in two pieces. When, however, the diameter of the bore-hole and, therefore, that of the guiding bore-tube is considerable it is made of several pieces fastened together like the staves of a cask. For a bore-hole intended to be about 70 fms. deep, part of the trunk of a tree (pine or fir), about 12 ft. long and 15 in. diameter, is used; it is first made uniformly round, and then sawn along its middle into two equal semi-cylinders. Each half is then hewn with a round hatchet, so that when the two are afterwards fastened together by means of iron rings or screw clips, they form a hollow cylinder 15 in. in exterior and 9 in. in interior diameter. The two halves are sometimes fitted together with a grooved and tongued joint. Except in the case of salt springs or beds, it is not necessary that the guiding bore tube should be water-tight. The length of the guiding bore tube varies from 3 to 20 ft. or more; the diameter is determined by the greatest diameter of the bore-hole, which it must always exceed. The usual diameter of bore-holes varies from 5 to 9 in.; that of the guiding bore tube may vary from 8 to 11 in. interior diameter.

With regard to the upper part of the guiding bore tube, we shall complete our description later when describing the bore tube shutter. The lower part is usually provided with a shoe, made of strong sheet iron, to prevent injury to the lower part of the guiding bore tube; is the guiding bore tube to be rammed down, then the shoe is best made entirely of iron, and steeled at the edge; it must also be fitted flush with the outside of the tube. The lengths of piping used in the mines for pumping purposes can often be used in constructing the guiding bore tube.

Two such lengths of piping may be advantageously joined together, a block of wood, "the bore-bank," 3 in. thick, being attached to the uppermost flange to protect the top of the tube, and to which the bore-shutter can be fixed. The bottom flange has the shoe bolted to it, and in order to be able to fix it more steadily the lower extremity of the tube is lagged with wood, fastened with two iron hoops.

After the completion of the sinking of the shaft and the fixing of the timbering the guiding bore-tube is next fixed in its place. The centre of the bore-hole is marked exactly on the bottom of the shaft, and a round hole corresponding to the lower part of the guiding bore-tube is then excavated, and the bore-tube is carefully lowered into its place, and fixed in a truly vertical position by temporary wedging against the side of the shaft, but is permanently wedged in the hole. The next step is to construct the working scaffold or floor, which has also to serve as a permanent support to the upper portion of the guiding bore-tube. This should be placed at about 2 to 2½ ft. below the top of the guiding bore-tube, as being the most convenient distance for handling the tools, &c. Two stemples, 9 in. square, are wedged tight in corresponding notches against two opposite sides of the shaft, and are placed just sufficiently wide apart to embrace the guiding bore-tube; two other stemples are similarly fixed upon and at right angles to the first, and the guiding bore-tube is wedged tight between these stemples. The scaffolding consists of planking laid across the upper stemples and resting at the ends on a couple of bearers wedged close against the sides. When this is completed the temporary wedging is taken away.

After the fixing of the guiding bore-tube, or at the same time if convenient, the guides for the rods are inserted. The guides consist of two wooden stemples, about 4½ in. broad and 4 in. deep, which for a length of about 1 ft. in the middle are widened on one side to 6 in. in width. In the middle both stemples are notched, so that when joined together they form a square opening through which the rods pass. The position of this opening should be accurately marked when the two stemples are already fixed in position. The guide stemples are held in position between two upright props fixed at the ends between two adjoining sets of shaft stemples, by means of an iron cotter, or, still better, they may be wedged to the horizontal shaft stemple by means of two grooved wedges. The two guide stemples may be held together by iron clamps. The number of sets of guide stemples will depend on the depth of the shaft, &c., but each set is fixed at right angles to the adjoining sets (above or below). It will very often happen that the joints of two rods will require to occupy the position of the opening in one or other of the stemples. In this case the wedge is simply withdrawn, and the two stemples are pushed sufficiently apart to allow the joint to pass through.

Is the ground below the surface alluvium of a loose nature, or a quicksand, then the bore shaft, provided the quicksand be not too thick, must be carried through to the underlying stronger strata, in order to be able to fix the guiding bore tube securely. This will occasion some difficulty in keeping the guiding bore tube perfectly vertical whilst it is being rammed down. For this purpose during the ramming it should be fixed between strong guides, fixed at the bottom of the shaft. When it is determined beforehand to line the bore-hole, the lining can be used, and, in fact, becomes a guiding bore tube.

B.—Arrangements at the surface for performing the boring operations. These we shall consider under four distinct heads—1. The arrangements for transmitting the blow or up and down movement to the rods, &c.—that is, the boring machine proper.—2. The arrangements for raising and lowering the rods, and the construction of the bore tower.—3. The arrangements for removing the debris from the bottom of the bore-hole; and lastly, the smithy and workshop.

1.—The arrangements for transmitting the up and down movement to the boring rods.

The oldest and simplest of these, and one which is yet capable of doing good service in the case of bore-holes of moderate dimensions, is the ordinary windlass and rope. The rope is usually of hemp, from ½ in. to ¾ in. in diameter, and the barrel of the windlass 6 in. to 9 in. in diameter. According to the weight of the rods to be raised the rope is coiled two or three times round the barrel of the windlass, and by means of the windlass handle the boring tool is raised from 8 in. to 12 in., in order to allow it to fall. This occurs in the following manner:—One of the workmen pulls at the loose end of the windlass rope, by which the friction between the rope and the barrel may be made so great as to prevent the former slipping when the barrel is rotated in order to raise the rods. When the borer has been raised to the proper height the man who holds the end of the rope slackens suddenly out to somewhat more than amount of fall, when the rods suddenly drop down with their whole weight to the bottom of the bore-hole. When the rods have reached the bottom the man pulls the end of the rope tight again, and on continuing to turn the barrel the rods are again raised, the rope is again slackened out, and another blow follows. As an example of this method may be mentioned a bore-hole at the Theresa Pit, at Rakonitz, in Bohemia. The bore-hole was 3 in. in diameter, and completed in 110 (12-hour) shifts to a depth of 70 yards; at first only four men and afterwards six men being employed in the shift. The upper 40 yards of the rods being ¾ in. square, the rest 1 in. square, the barrel of the windlass was 6 in. in diameter, the rope ¾ in. diameter, and the lift varied from 8 in. to 13 in. The shaft, which had already been sunk to a depth of 30 yards, was used as a bore-shaft. In the present day, however, this arrangement, notwithstanding its simplicity and readiness of construction, is only used for very small borings, the loss of time and small efficiency being its outweighing disadvantages.

Formerly a spring pole was much used for exploratory boring in England and Westphalia. This consisted of a long stem of a tree, 68 ft. to 70 ft. in length, which was firmly fixed at the root end into the ground, and at two-thirds of its length from the end is supported on a block of wood placed on an earth wall. At about 6 ft. from the end a hook is fastened to the pole, from which the boring-rods are suspended by means of a short chain; at the extremity a cross handle is fixed for the workmen, and foot-boards are placed on

* Being Notes on a Course of Lectures on Mining, delivered by Herr Bergrath Dr. VON GRODDECK, Director of the Royal Bergakademie, Clausthal, The Harz, North Germany.

the ground. This arrangement only allows of boring with rigid rods; the lift can only be very small—that is a high as the spring of the pole will raise it; the rapidity of the blows is very great, fifty and more to the minute. As the bore-hole becomes deeper the wooden support must be moved nearer to the end of the pole. For shallow depths and in easy strata this method is still used, but for bore-holes of considerable size and depth it is not advisable. The hole cannot be relied upon as being straight, since there is no regular turning round of the tool, which rather dances up and down in the bottom of the bore-hole.

The next arrangement we have to consider is the bore lever. As the depth of a bore-hole increases, so must the weight of the rods become greater and greater, and in order to be able to handle these heavy tools with ease and rapidity recourse must be had to some mechanical arrangement; the simplest and most efficient for the ordinary process of boring is the bore lever, which is essentially a straight lever with unequal arms, to the shorter of which the boring rods are attached, the workmen taking hold of the longer arm. This simple arrangement suffices for bore-holes of upwards of 200 fms. deep, and 8 to 10 in. in diameter. With a greater size and depth of hole the labour becomes too heavy and expensive for men, and boring machines must then be introduced. As the lever has sometimes to support a very considerable weight, it must be made of some correspondingly strong material, and although oak and some other woods are stronger, still it has been found in practice best to make them of fir. The tree stem which is chosen for this purpose must be healthy, and as free as possible from knots; the length will naturally depend much on the weight to be borne. Whatever may be the size of the lever, the construction is essentially the same. As an example, we shall describe a bore lever, used by Mr. Beer, in boring with the application of a free falling apparatus to a depth of 150 fms. in search of coal at Rakonitz, near Prague, in Bohemia. The total length of the lever was 18¾ ft., the relation of the two arms being as 1 to 5·8, which was increased to 1 to 9 at the depth of 450 ft., and with a diameter of hole between 4½ to 6 in. At the head of the lever the depth of the beam is 12 in. by 8½ in. broad; this section remains the same for a length of 5½ ft., when it narrows gradually to the tail of the beam, where the press handle is fixed, having there a depth of 8½ in., and a breadth of 7 in. The lever hook passes through an elliptically bored hole in the lever head, in order that with a varying inclination of the lever it may always remain vertical. This hook must be most carefully made, and if any flaw is detected in it it must be removed and repaired. The upper end of the hook has an eye, through which a cross piece of bar iron passes; this latter rests in a metal bearing fixed on to the upper portion of the lever head.

A PIECE OF COAL.

Prof. WILLIAMSON, F.R.S., of Owen's College, Manchester, lectured on Tuesday at Barnsley, taking for his subject "A Piece of Coal," to hear which there was a large audience. The Professor said that there was clear proof that the district they were in during the early period of the formation of the carboniferous measure was under the sea, and if they went to Edinburgh they would find the coal fields there to be of the same age as the limestones of Yorkshire and Derby-hire. There they had in place of these limestones a rich series of coal deposits, which were once the sites of magnificent and flourishing forests. If they went to France they would find at St. Etienne that they were in the same position with respect to coal as they were at Edinburgh. They invariably found that beds of coal rested on a rough, bluish-grey clay, which was generally known by the name of fire-clay, for the reason that it is the best material for making fire-bricks of. That clay, upon which every seam of coal both in this country and America rested, had evidently something to do with the formation of the coal itself. The discovery of the association of the two was made by Sir W. Logan, who further pointed out that in the fire-clay there existed enormous quantities of very peculiar plants, known as stigmaria. Then there were leaves to be found which had been turned into coal. We have discovered that leaves and wood can be converted into coal, but there was another proof that came nearer home. The Romans found out the beauty of Whitby jet. Jet is another form of wood, which they would easily see by putting a piece of it under the microscope. Seams of coal vary in thickness, some of the lowest near Halifax being very thin. In America there were seams 30 ft. in thickness, some by the side of a river—But how did the plant get there? Some of our navigators had noticed the fact that in sailing in the Gulf of Mexico large masses of vegetable matter, rafts of trees and branches, had been brought down by the Mississipi, washed away by floods from the banks of the river, and carried into mid-ocean. When these rafts became so thoroughly water-logged that they could float no longer down they went to the bottom, and these navigators came to the conclusion that that process was the history of the formation of coal. But this explanation did not satisfy everybody. Some people, however, were of opinion that the explanation would be found in the history of our peat bogs. Some light was thrown on the matter in the making of the railway between Bolton and Manchester, by Mr. Hawkshaw, the engineer.

In superintending the work he found at Clifton some fossil trees standing on the coal, the roots coming down to the coal. The stem was not less than 12 ft. in circumference, with enormous roots. It was clear that these trees had grown where Mr. Hawkshaw found them, standing in the precise spot where the seeds were shed millions of years ago, shooting up and growing age after age. Consequently it was fully established that coal was made of various matters contributed by trees where it was found. In Lancashire they had from 20 to 30 beds of coal, and how did they get there? The levels of land and sea were constantly changing, and were changing at the present time. The old sea-line can be traced high up on the Swedish and Norwegian Mountains. It was the same in South America. If they went to the middle of the Pacific Ocean, where thousands of years ago there were hugh continents, the levels were going down, wherever they had volcanoes in an active state the land was rising, and wherever they had corals forming their reefs the land was lowering. If they went to the sea coast between Manchester and Liverpool they would find a submarine forest, with stumps of trees washed over by the tide. The land there was sunk and the salt water is washing the mud over the area, gradually filling up the places, and so coal would be formed years ago. The same thing existed formerly, and the sea had covered forests with fine mud, and the quality of the coals depended on the kind of routine they were subjected to. With regard to the various qualities, they would notice that whilst the floor of the bed was always the same fire-clay, the roof varies a great deal. In some places it was a dense blue clay, in others a sandstone, and the beds themselves broken and shattered by some tremendous action by a marvellous and mysterious arrangement. If those strata had remained in horizontal layers they would have been far out of the reach of man, but by some mysterious power they are turned up and twisted and brought near to the surface. They were brought within reach because there had been wonderful agents at work which tore up the earth's crust, and there are no strata so ancient but had been brought to the surface at some point. Such had not resulted from any volcanic action, but from shrinkings and contractions which the earth's crust had undergone.

The earth cooled down and shrunk, so that fissures were made in the earth's crust, and it was a great blessing to all of them that it did. If those coal beds had swept along with a continuous sweep unbroken by faults no human machinery that was ever invented could have kept the mines from being drowned out with water. The faults enabled the coal strata to remain dry, and allowed the collier to work. It was sometimes found as the coal is being worked on getting to a fault that the quality deteriorated, and when worked away from the fault it improved. That he considered depended on the nature of the material which filled up the faults. The faults represented a mass of rocks that were cracked through. There was a great fault running near to Bolton, one side of which was lifted 1000 ft. above the other, and this could not have been done without producing a mass of ground-up material, and, therefore, if that mass which filled up the crack of the throw consisted of a porous material, the gases of the coal would escape through it, and so the coal would be of a worse quality. The faults, as well as the roof, have had their influence on the composition of the coal. They saw what had taken place—the vegetable mass, in the first instance, had a uniform composition, but it gradually became altered. The changes took place atom by atom; a little gas was let in, then a little more, and so on, the change going on during thousands, or it might be millions, of years, so thoroughly permeating the whole mass that they could see how the operation had gone on through those years when the more volatile gases escaped where the roof was porous. Whereas if everything was the reverse the coal would approach more nearly to the composition of wood. They thus learnt that the reason why coal had different qualities depended altogether upon how far the original gases had been retained by the coal, and how far the more volatile of them had been lost and passed away entirely. So much for the qualities of the coal, and as to the tree of which coal was formed. The forests were different to the forests of the present day. The forests of to-day consisted of oak, ash, and so on, but none of the trees that existed in the coal age ever represented any of those trees. The trees that produced the great bulk of the coal were the representatives of things that are still growing around them, but on a very dwarfed scale. Botanists are familiar with ferns and mosses, and those classes of plants represent the largest plants which furnished the material of which coal consisted. There was no class of plants that had lived through so long a period of time and undergone so little change in their organisation as ferns. They had vast masses of ferns in the coal, but on the other hand they had fern trees towering 20 or 30 feet in height. Ferns are new friends with old faces. The lecturer concluded his able address by giving it as his conviction that the whole system of the earth had been built up by the hand of a good and wise Creator.

HOMOGENEOUS IRON—THE SYSTEMS OF PRODUCING IT.

An interesting paper on Homogeneous Iron and the degree of Homogenity to be expected in iron produced by various systems of puddling, and subsequent working, by Mr. Henry Kirk, of Workington, was taken as read at the last meeting of the Institution of Mechanical Engineers, in order that it might be discussed at the next meeting. Manufacturers of finished iron are, Mr. Kirk remarks, frequently blamed by engineers for not giving them the exact qualities required, and they excuse themselves by saying that the pig-iron supplied to them under the same name varies very much in its composition, and that they cannot make an invariable product from it. Smelters in turn complain of the minerals, and mineowners say that they can only supply such minerals as the mines yield. Thus everyone exonerates himself, yet the truth is, in Mr. Kirk's opinion, that no one of the departments is without its difficulties, and that if each instead of ignoring those of the others would patiently examine them, and endeavour to remove, mitigate, or neutralise them, in the end all would be gainers. The term homogeneous seems to have been first applied to iron about 20 years ago, and meant a comparatively pure iron manufactured by melting too low in carbon to be called steel—in fact, presenting none of its characteristics. But within the last ten years makers of homogeneous iron have appropriated the term steel, steel being something better than iron, and now there is a disposition to adopt the word homogeneous to iron produced by puddling, whereas puddled iron is not, and perhaps cannot be, made truly homogeneous. It is probable that the use of the term steel has much hindered the employment of true homogeneous iron in works of construction, for which it appears to be eminently fitted by creating false impressions as to its hardness and the expense of working it.

Iron may be homogeneous and yet contain all the elements usually associated with it, such as carbon, silicon, sulphur, phosphorus, and manganese; but iron containing cinder cannot be truly homogeneous because the nature of cinder is altogether different from that of iron—and, in fact, cinder does not combine with it at all, but only remains diffused through the mass. Iron produced by melting and casting into solid ingots, carefully heated and well worked, may properly be called homogeneous. Such iron has no right to the term steel when the carbon is not above 0·30 per cent., which is an amount sometimes exceeded in the very best brands of wrought-iron; for instance, an analysis of Swedish iron is given by Percy with 0·386 per cent. of carbon, and one of Russian with 0·31 per cent. Mr. Kirk gives the result of an important series of trials representing the whole of a puddled heat, both in tests and analyses. The sizes of iron are all the same, which is better for comparison with each other. The breaking strain is from 23 to 25 tons per square inch; the contraction from 31·6 to 50 per cent; the extension, over 10 in. in length, from 20·1 to 26 per cent. An effort was made in this heat to get the carbon lower than before, and it gave an average of carbon of 0·131 per cent., against an average of 0·175 per cent; but the sum of the phosphorous and silicon had risen from 0·133 to 0·243 per cent., and in one allied set of samples it is seen that as the carbon falls the phosphorus and silicon increase. Thus there was of carbon 0·180 per cent. in W. R. 3; 0·150 in W. T. W.; 0·115 in W. 5; and 0·090 per cent. in W. R. 5; whilst the phosphorus and silicon was 0·093 per cent. in W. R. 3; 0·260 in W. T. W.; 0·310 in W. 5; and 0·345 in W. R. 5. Some of the phosphorus and silicon appearing in the analysis of iron properly belongs to the cinder remaining in it. There is, Mr. Kirk considers, a probability that these oscillations of carbon on the one hand, and phosphorus and silicon on the other, are not accidental, but are really cause and effect.

A considerable amount of carbon often remains in the partly-puddled iron after it has reached a spongy condition, and the cavities of it are filled with cinder, which generally contains a good deal of phosphoric acid and silica. It is likely that some of the oxygen for the removal of the carbon is obtained from this cinder, and that it sets free iron, phosphorus, and silicon, which are added to the puddled ball. Colouring is lent to this supposition by the behaviour of puddled iron at the hammer, by the effect of a puddled heat waiting in the furnace after it is made into balls, and by the composition of puddled ball cinder. Frequently a slight flame is observed from a puddled ball, and when the hammer drops upon it, and the cinder is thereby brought into closer contact with the iron, it is immediately covered with the flames of carbonic oxide. When the puddled balls remain too long in the furnace the quality of the iron is greatly impaired; though the causes of this do not appear to have been investigated, it is a well-known fact cinder expelled from puddled balls is, he finds, invariably poorer in iron and richer in silicon and phosphorus than the cinder left in the furnace at the time the balls are withdrawn. He also found that as the carbon increases so does the stress at the fractured area. Mr. Kirk attaches much importance to the puddled-bar system, because any iron not properly worked when rolled off from the puddled bloom without re-heating tears into holes of various sizes, from the smallest speck upwards, by the action of the rolls, and when the pile is subjected to the heat of the furnace these holes allow the raw places to receive a greater share of the heat, and they act as receptacles for cinder, melting off the iron, both of which tend to purify it in a high degree, especially as this cinder is much superior to that in the puddling furnaces.

MECHANICAL FIRING OF STEAM-BOILERS.—At a meeting of the Society of Engineers, held on Monday evening, March 5, in the society's hall, Westminster Chambers (Mr. Thomas Cargill, C.E., president in the chair), a paper was read by Mr. J. Walter Pearse on this subject. The author first pointed out some of the disadvantages of hand-stoking, and observed that so far back as 1813 mechanical firing was proposed. In 1822, Mr. J. Stanley invented a stoker with crushing rollers and a single horizontal fan, to which, in 1834, he added rocking fire-bars. In 1838 Mr. Juckes patented his first stoker, and in 1841 he invented the endless chain of fire-bars, modifying it again in 1842. In 1863 Messrs. Wilson and Smith brought out their furnace in which the fire-bars were made to travel backwards, carrying the fuel from a hopper to the back of the grate, an arrangement which was improved upon by Messrs. Vicars and Smith in 1867. In 1870 Mr. Dillwyn Smith patented his stoker, in which the fuel is fed onto distributing fans revolving horizontally. This arrangement was improved upon, in 1870, by Mr. J. F. Deacon. Further additions were subsequently made by Mr. T. Henderson. The Henderson stoker was then described by the author. In it the supply of fuel is affected in the same way as in the Dillwyn Smith machine, but the fire-bars are made to move by simple gear connected with the stoker. Every other bar rises and falls, while the rest slide to and fro, the effect of this action being to clear off the clinker. The Frisbie feeder, improved by Mr. J. M. Holmes, is for slow combustion and intermittent feed. The coal is thrust up underneath, and in the middle of the fire, so that the gases evolved are consumed on passing through the incandescent mass. This stirs the fire and propels all clinker to the circumference of the circular revolving grate. Mr. Holroyd Smith's "Helix" fire-feeder gives a continuous feed from below by means of a screw working in a casing connected at its upper side with a trough which takes the place of one or two fire-bars. The saving effected by these stokers was stated to be two-fold, first in the quality of the fuel used, and next in the quantity consumed, a reduced first cost being also incurred, owing to smaller boilers and fire-grates serving for a given power, with more perfect combustion.

CHEMISTRY OF GAS MANUFACTURE.—At the Society of Arts, on Monday, the first of a series of four Cantor lectures on this subject was delivered by Professor A. Vernon Harcourt, F.R.S. The first points considered were the natural formation and chemical nature of coal, the lecturer giving the various theories which had been promulgated with regard to the origin, or rather to the exact mode of deposition of the coal beds. The main changes produced in coal by the application of heat were then described—the process of gas manufacture, and the collection of the various bye-products involved in the same, being illustrated by aid of a model of a miniature gas works. Various other models and specimens were placed on the table, and a number of diagrams lent by Dr. Frankland, Professor Tennant, and others, lined the walls. The properties and uses of the various substances, solid, liquid, and gaseous, yielded by coal were then referred to, including, besides ordinary illuminating gas, tar, naphtha, carbolic acid, benzol, creosote, lampblack, anthracen, pitch, and coke. By indirect means, as the lecturer explained, chemists had been able to form from certain products of tar distilation previously enumerated—benzol and anthracen—a series of magnificent dyes. From the former material were prepared the whole of the beautiful aniline colours first discovered by Mr. W. H. Perkin; and from the latter, alizarin—the artificially prepared principle of madder or Turkey-red, the use of the natural dye having been thus practically superseded. The processes whereby these results were obtained from the formerly unpromising refuse material, tar, were among the most beautiful in the range of chemistry, and must ever be regarded as crowning triumphs in the technical applications of that science. The use of coke as a heating material for household purposes was warmly commended by the lecturer, its superiority for that purpose, as well as its economy as compared with coal, being strongly urged. In order to faciliate its use such reforms as had recently been advocated must be resorted to in our fire-grates in order to do away with the wasteful draught through the bottom of the stove, which only served to waste fuel. The true principle of heating lay in the production of as large a glowing surface as possible, a bright flame being in no way necessary or even desirable.

TESTING THE AIR OF MINES.—A peculiar arrangement of apparatus for facilitating the ascertaining at any moment at the surface of mines the composition of the atmosphere in the mine workings, the proportion of fire-damp therein, and the precise moment at which the mixture is about to become dangerous, has been invented by M. A. LEMAIRE-DOUCHY, of Paris. The essential feature of the invention, which it would be extremely dangerous to apply in connection with mines producing fire-damp, consists in the automatic and continuous withdrawal outside or to the surface of a mine of samples of the air in any of the workings, and supplying such samples to analysing apparatus for the purpose of their being analysed on the spot at any moment by any of the known methods or processes. A continuous air-exhauster is employed, which consists by preference of two closed vessels supported on the opposite ends of a lever capable of oscillating vertically upon a fixed centre. The first of these vessels is connected at its top by a flexible tube with a water supply pipe, and at its bottom by another flexible tube with the top of the second vessel. A third flexible tube is attached to the bottom of the second vessel for the exit of the water after it has accomplished its object of expelling the air and forming a vacuum in each vessel alternately, the water on escaping from the first vessel flowing into the second vessel. These tubes are all provided with stop-cocks, which are opened and closed by tappets brought into action by the rising and falling motions of the vessels. The descent of each vessel is checked (until it has been filled with water) by the action of a counterweighted lever and trigger catch. On the tops of both vessels there are provided three cocks, one of which communicates by tubing with the subterranean workings or galleries of the mine, so that when the vessel is being exhausted a portion or sample of the atmosphere in the workings will be drawn into it. The other two cocks on each vessel communicate with analysers arranged for testing the air, or mixture of air and gas, by any of the well-known methods. As the water rises in each vessel the sample of air contained therein will be expelled through the last-mentioned tubes into the analysers, and when filled with water the vessel will descend by its extra gravity, and produce the requisite opening and closing of the cocks. The tube or tubes which descend into the mine are connected by branch tubes to a series of cocks situate inside the mine (one for each gallery or working), and from each of these cocks there is led a separate pipe to each gallery. Any one of the said cocks is capable of being opened and closed from the surface, either by the aid of a battery or magnets, electric apparatus, and electro-magnets, or by compressed air, or otherwise. In the case of using electricity the wires from the coils of the electro-magnets of the cocks are carried up to a commutator outside the mine, which indicates the several corresponding cocks below, so that on establishing a circuit through any particular electro-magnet the corresponding cock will be opened and the air drawn from the gallery or working in connection with the said cock. Facility is thus afforded for testing at any moment the composition of the air contained in any particular part of the mine. If desired, an electric bell or other alarm apparatus may be connected with the analysers, so as to give due notice to the attendant before the mixture of air and gas reaches the point of danger.

IMITATIONS OF MALACHITE AND OTHER STONES.—A process of decoration which is calculated largely to extend the use of terra-cotta has been invented by Mr. CHARLES BROCK, of the Watcombe Works, St. Mary Church, Devon. He mixes various earths and oxides, the colours and proportions of which will depend upon the special class of object to be imitated, and blends them at such a consistency as prevents their mingling too much together. He then covers the surface of the article to be decorated with a veneer or thin layer of the blended materials. He next glases the surface with a lucid glase, and submits the article to burning, the result being an exact imitation of the description of stone or marble desired, and which is more durable than the real stone itself. This process can not only be used for ordinary pottery, but is also applicable to a great variety of purposes, such as architectural columns, bosses, panels, inlays for furniture, columns for busts, vases, and other kindred purposes.

ENGINE SPEED INDICATOR.—The object of the invention of Mr. A. GRAVE HOBSON, of Liverpool, is to provide a simple, efficient, and cheap apparatus for indicating the speed of engines and their shafts, so that the speed can be readily ascertained by the engineer in charge, or any other person. In practice he attaches to the ordinary speed governor of, for instance, a steam-engine a bracket or bar having a graduated edge, being an index bar; and to the lever connecting the governor to the valve rod he attaches a pointer which may be a continuation of said lever. The pointer comes over the face of the index bar, and is so arranged that when the governor is at rest the pointer stands at zero, and as the governor rises the pointer indicates on the graduated index bar the number of revolutions the engine is making. Secondly, he attaches to the column carrying the governor a graduated index bar, and to the sliding sleeve of the governor he attaches a bar which carries a pointer,

and as the sliding sleeve rises and falls by the action of the governor the pointer indicates the speed of the engines on the index bar; and, thirdly, he attaches to the column carrying the governor a quadrant dial marked with different degrees of speed. The dial is provided with a pointer or finger having a quadrant pinion, and to the sliding sleeve of the governor he attaches a rack which takes into and works the pinion on the pointer or finger. As the sliding sleeve rises and falls the speed of the engines is indicated on the dial by the pointer or finger.

MINING AND STOCK EXCHANGE NEWS OF THE WEEK.

Messrs. F. W. MANSELL and Co. (Sworn Stock and Share Brokers), 43 and 43A, Palmerston Buildings, Old Broad-street, write to us as follows:—

THE "BONANZA KINGS"—No. 1.—Mr. John E. Mackay, now a "Bonanza King," is probably the youngest of all the world's great millionaires. Mr. Mackay was born in Dublin in 1835; when quite a youth he proceeded to America, and was for some years engaged in the office of a shipbuilder in New York. In the latter part of 1852 he joined a party that was going to the El Dorado of the West, and reached the Pacific Coast late in the winter of that year. Having a natural bias towards everything connected with mining, he at once pursued it as a business. His first employment in mining was in Alleghany, Sierra County, where he accumulated a small "stake," and then proceeded to Virginia City. Here he began a tunnel on what is known as the "Union ground," north of the Ophir, on the Comstock lode. Not long afterwards his funds gave out, and he worked for some time as a timberman at $4 a day. At this period of his career Mr. Mackay was often heard to say that his greatest ambition was to accumulate $25,000, with which he wished to make comfortable his mother's declining years. After many changes of fortune he became interested in a firm, which was afterwards extended by the addition of Messrs. Flood and O'Brien in 1864, and so continued until 1868, when Mr. Fair took the place of the senior partner. The first few $100,000 of the now stupendous wealth controlled by this firm was made during their control of the Hale and Norcross Mine in 1865-7. The career of Mr. Mackay since that time has been chiefly noticeable for the active part he has taken in the incessant efforts made by the four partners to obtain further acquisition of territory on that marvellous deposit of precious metals—on the Comstock lode. Backed by their constantly increasing capital, their efforts have resulted in opening to the world the wonderful Bonanza Mines. When in Virginia City we "interviewed" this gentleman, who not only received us most courteously, but accompanied us throughout the vast workings of that great treasure-house—the Consolidated Virginia Mine. Mr. Mackay represents his firm at the fountain head of their resources, and although surrounded by every allurement that wealth can command, and the recipient of the revenue of an empire, Mr. Mackay is a frank, unassuming, hard-working business man, but as far removed from the proverbial niggardliness of the rich man as he is from vulgar pretence; his quiet but princely liberality to his friends, especially those of his early career, is well known. He owns three-eighths of the Bonanza Mines, from which his income is estimated to be over $800,000 (160,000*l.*) per month. It has been calculated, in regard to the total income of this youngest of the "Bonanza Kings," that each minute of the day and night $25 (5*l.*), golden dollars, drop into his pocket with mechanical and monotonous regularity—or rather, it would be a more appropriate figure of speech to say that that amount drops into his already dropsical bank account.

A good deal of misconception has been conveyed to English readers by the ill-based information recently set forth in the Times by their correspondents' letters from San Francisco and Philadelphia. When reliable statistical data and information can, we know, be obtained from any member of the "Bonaza Firm," one is amazed to find the representatives of our leading organ publishing statements as to the condition of the Bonanza Mines, giving to English shareholders an entirely wrong view as to the value of their property. The San Francisco Stock Exchange says:—

"The shipments up to Feb. 3 on account of the California mine make the yield for the month so far $1,161,028·12, with from $150,000 to $200,000 yet to come on February account. This removes all doubt concerning the dividend, and it is now announced that it will be paid on the 15th inst. as usual. The Con. Virginia dividend will be passed this month, but will surely be resumed in March if all goes well. There is now no doubt that both these mines have a continuation of the enormous ore body on the 1650 and 1700 *ft.* levels, and if greater care is pursued in extracting the ore from them there will be no difficulty from caves, foul air, &c., which have so annoyed the miners on the levels above. It is said by miners of the Virginia City, who have the best means of knowing, that from the pitch of the east clay wall the indications are that the new developments will prove even wider than the ore body above. One man enthusiastically says that he believes the "bulge of the bonanza" will yet be found at the 2500 ft. level. With such favourable accounts as these it would seem to be no more than the square thing for the management to show up their discovery as quickly as possible, and give the boys a chance."

ISABELLE (Gold and Silver).—Mining has grown to be as legitimate as any other business, its success depending on the same qualities that ensure competency and wealth in any other calling; and its failures and losses can be traced to the same inexperience and recklessness that eventuate in lack of success in the standard lines of business. An industry that requires the mechanical and scientific knowledge that regular mining requires cannot justly be said to be inimical to good habits or morality. The want of accurate topographical geological knowledge of the surrounding country is indicated by the mineral discoveries made almost daily. The particles of gold picked up on Sutter's Farm, in California, in 1848 have resulted since then in the enormous yield of bullion of about the sum of $1,000 000 000 for California, and not less than $230,000,000 for Nevada, besides the additional mineral wealth obtained from the other Territories and States through the agency of the original discovery. Many of the most profitable mines were brought into notice accidentally—the Oneida, in California, was discovered by a hunter, who chased a rabbit to some large quartz croppings, in which he found rich specimens of gold; the Hinckley was first struck in digging a cellar; the Woodside was the result of prying up a piece of rusty rock that outcropped, the underside of which was speckled with gold; the Valenciana, in Mexico, was first discovered by a young Spaniard, who, after many privations, at last struck an immense body of ore, from which alone was extracted from 1787 to 1791 the sum of $14,764,492, out of 134,188 tons of silver ore; the Comstock lode, in Nevada, which has produced about $250,000,000 of silver and gold, was discovered accidentally; and one of the most noted mines of Sirralor, in Mexico, was discovered by a pious *ranchero*, who, losing his rosary, remained in the mountains during the night searching for it. Having made a fire to protect himself from the cold, in the morning he beheld the stones on which he had rested his wood sparkling with silver.

But to the keen eye and experienced instinct of a trained gold and silver miner the "signs" and "indications" are almost infallible—the trend of mountains; the presence of tellurets in quartz, which contains crystals of felspar and carbonates of lime and iron, when the speedy appearance of ore may be relied upon; the knowledge to distinguish between the different kinds of pyrites; the manner of inspecting quartz croppings, to discover pockets—one of which yielded in a day to two men $30,000; the rounded and dome-like appearance of mountains, abraded through countless ages, from which the gold has been washed down into placers; smooth well-rounded hills and beds of gravel either near a stream or on the side or top of a hill; quartz veins and boulders; the beds and bars of ancient streams, especially where a ridge of rock extends across the channel, and where the gravel is shallow; or beds of streams which run dry in summer, which render examination easy; to follow float quartz or other indications to the veins; to know how to wash gold, and detect the minutest particles of mineral. These are some of the indications which naturally attract the practical miner; these, or some of them, are features so strikingly marked in the topographical geology of the network of veins, the croppings of which leave no doubt as to the early success of the Isabelle Mines—features that clearly point to the opening out of large deposits of gold on some of the veins, and in others (as in the Exchequer) of both the precious metals. The Isabelle group of veins has all the essential "signs" that miners regard as finger-posts to wealth.

EXCHEQUER (Gold and Silver).—The latest official advices (dated Feb. 12) state that the long braces (35 ft.) for the hoisting-frame had reached the mine, and the manager hoped to get the new engine to work during the week. The old hoisting-works has been sold to the I.X.L. According to letters received O'Hara had arrived at the mill on Feb. 15, and was busy connecting the mill machinery with the furnace, when the mill would be ready to run. The weather continued remarkably open, and an attempt was being made to haul additional supplies from the mine to the mill. Mr. Arnott (of the Vulcan Ironworks), writing to the manager with reference to the prospective enlargement of the mill, states that the whole of the present mill is, in his opinion, complete in all respects. There can be no doubt as to the value of the ore, and no anxiety should exist in the minds of shareholders as to the actual results of the monthly clean-ups, after Mr. O'Hara's experimental runs have been finished, and such adjustments made of the machinery as he may consider necessary.

The delay in commencing to run the mill appears to cause some trepidation among shareholders, but allowance should be made for the locality and the season of the year. As already stated, Mr. O'Hara arrived at the mill on Feb. 15, and immediately set to work making the necessary connections between the furnace he had erected and the mill completed by Mr. Chalmers. It should be borne in mind that Mr. O'Hara's payment, as well as reputation, depend upon the success of the mill runs; it is not probable, therefore, he would be at all disposed to risk both until everything was complete. As the furnace is worked by machinery, three or four weeks might elapse before Mr. O'Hara could get everything complete, and he, as well as the manager, may have taken into account also the effect of frost upon the pipes of the mill by turning suddenly hot water into them. Neither Mr. O'Hara nor Mr. Chalmers would be justified running this risk when by waiting a few days there might be suitable weather. The winter, however, has been remarkably open, and in a few days probably there will be an official reply to the telegram sent by the directors enquiring if the mill and furnace had actually started. In the meantime, shareholders should await the result, and not be influenced by those who never saw a mine nor a mill, but who are quite ready to purchase shares when forced down in price to a low level. This expression of opinion is disinterested on our part, as we are ourselves buyers of the shares.

As stated above, the winter thus far has been open. A local contemporary, referring to this subject, says:—

"Thus far the winter of 1876-77 has been a remarkably moderate one for Nevada, having recorded less severe storms of snow or rain than any of its predecessors since 1862. The real benefits accruing from a delightfully moderate winter season, with storms cut out and sunshine left in the calendar, are far greater to our people generally than any damage that may have resulted or will accrue to the mining population from it. Notwithstanding that this section of the country has not been visited so frequently as usual by the "white-footed angels" from the region of snow and ice, still nearly all that have come have arrived at such favourable times that they have taken up permanent quarters in our timbered mountains and canyons, and it will be long past the sultriest days of summer ere they will leave us through our mountain streams in a pathway trickling with their own bright tears. In other, and possibly more comprehensible, language the present fall of snow in the mountains, with what we shall get later in the season, will be amply sufficient for all our needs as a mining community, and from the present agreeable outlook the mining season of 1877 bids fair to be as fully freighted with profitable results as any that has been experienced for years."

I. X. L. (Gold and Silver).—The last advices, dated Feb. 12, state that the new hoisting works would be complete in eight days. The north drift was in 463 ft. from cross-cut in the 200 ft. level. Progress had been somewhat retarded by a strong flow of water from the face. The drift for its full width is in quartz at the face and making in the hanging wall, enabling the manager to give the correct width of the lode. It may not be understood on this side what the manager's plans are. They are these—1. To drift to the ore body in the 200 ft. level.—2. To sink to the 400 ft. level.—3. To take out ore in the most advantageous points of operation.—4. To run to the ore body in the 200 necessitates for ventilating purposes rising to communicate with the O. K. shaft, which has been sunk from surface. With reference to the ore body in the 200 ft. level, the manager states that all the indications lead to the conclusion the body of ore is close at hand—lode widening, casing improving, and water increasing. The Buckeye adit is also being run to take out some good ore, and work is being done in the lower tunnel for the same object. Mr. Arnott, the contractor of the mill, states that the whole excavations for the foundations have been in solid rock, entailing a large expense to him as contractor, adding that "the mill just finished is one of the finest and best equipped mills in Nevada, and that in its erection he has done a great deal more than the contract required." The Alpine Chronicle of Feb. 10 says:—

I. X. L.—We hear that rich ore has been struck in the lower level of this mine, and that the drift is nearly at the great ore-chimney from which the rich ore was taken in the upper tunnel in the early days of this district. We look for a brilliant future for this mine.

EBERHARDT AND AUROBA (Silver).—A correspondent from Hamilton City—a short distance from Treasure Hill—states that the vein in the ore chamber has enlarged considerably, and that a number of the miners discharged a few days previously had again been put to work; and adds that, should the fine weather continue, it would not surprise the writer to hear that Capt. Drake had started up the mill again, which at this season of the year would be an unusual thing. The official cablegram just to hand states that some ore has been found in the drift east from the old ore body, and the incline was looking very favourable. In the tunnel the rock was hard. During February the total expenditure had been 2000*l.*, and the estimate for March was 2000*l.*

FLAGSTAFF (Silver).—According to our private advices, the various points of operation in this mine are fully maintaining their productiveness. The average output is 65 tons per day, yielding a net profit estimated at about 200*l.* Additional arrangements had been concluded that will probably increase appreciably the current rate of profit. The re-possession of this mine by its shareholders, and its remunerative condition, with other circumstances yet to be made public, tend to regain the confidence of English investors in American mines. Hitherto the fatal mistake has been the inordinate amount of capital with which, in most instances, American mines have been weighted. Failure has not resulted from the mines having been unworthy of exploration—on the contrary, we found by enquiry in the several districts we recently visited that, with two (or at most three) exceptions, the mines introduced upon our market had never been even superficially explored, because the subscribed capital instead of being applied to the opening out of the mines had passed into rapacious vendors' pockets; the few in which any prospecting has taking place had been left without working capital, but expected to provide it by revenue. American mines have been thus brought unjustly into discredit, but the cloud is now rapidly passing away; and by the initiation of the more wholesome principle of making vendors' interests exclusively identical with the success of the mines vended, it will soon become a great fact that American mines are a most profitable channel for the employment of English capital. Says the Salt Lake Tribune of Feb. 10:

"The Flagstaff Mine, which is now regarded as one of the largest and richest mines on the Pacific Coast, is soon to be re-timbered and put in first-class shape."

PATELEY BRIDGE (Lead).—This week's official report states that the various points of operation progress satisfactorily. The 30 east is producing strings and patches of ore, indicating further improvement. In the 30 west the same vein is producing some lead ore, and is from 8 to 10 ft. wide, The south cross-cut, in the 20 west, to reach Lumb vein, is without change, the ground being hard and spare for driving, but letting out a strong feeder of water. The metal pitch, on new vein, has improved, producing 1 ton of ore per fathom. Fielding's vein, in the 20, over the north west drivage, is worth 15*l.* per fathom. The metal pitch in the top part of the bed, in the 20, is producing 25 cwts. of lead ore per fathom. The Sun vein, going east, if 6 ft. wide, producing 1 ton of ore per fathom.

GENERAL MARKETS.—Business throughout the week has continued to range within very narrow limits. There have been no incidents to affect prices materially, or rather the items of news, favourable and unfavourable, so nearly balance that operators and investors have not known what to think, and maintain a reserved and expectant attitude. Foreign bonds generally have been firmer, some Russian and Ezyptian loans showing a pronounced advance. As to the 1862, 1868, and 1873 issues, it may be mentioned that as the conversion has proceeded with such extraordinary rapidity—considering the vast amount of stock to be exchanged—a date not very distant will probably be named when the balance of the Five Per Cent. Preference will be distributed, consequently those holders of the old bonds who still delay conversion not only keep themselves without their dividends but run a decided risk of forfeiting their right to the 33*l.* 8s. per cent. of the preference stock; out of a total value of 44,000,000*l.*, representing these three loans, an amount of fully 38,000,000*l.* has now been converted. Home railways have been dull, and what variations have taken place are the result of moderate speculative dealings. American railway bonds show a considerable advance. Miscellaneous securities without special feature.

Meetings of Public Companies.

CEDAR CREEK GOLD MINES AND WATER COMPANY.

The adjourned fourth annual general meeting of shareholders was held yesterday, at the offices of the company, Austinfriars,

Mr. GEORGE BATTERS in the chair.

Mr. W. J. LAVINGTON (the secretary) read the notice convening the meeting.

The CHAIRMAN said: Gentlemen, the report of our manager, Col. Ludlum, has been circulated among you. It has entered so fully and in such minute detail into all matters relating to the property that your directors have very little to add. The report is made up to Sept. 30. From that period to Feb. 1 he had been engaged in preparing chiefly for the present campaign or washing season. The present rainy season was very late in setting in; but by a letter received from him under date Feb. 10, which I propose now to read to you, you will see that he had a full supply of water, and that your property was in full work. He states: "On the 1st inst. we had an ample supply of water, though none in excess of what our ditches could carry. The new or Middle Canon Creek ditch has done good service; by its aid we have at times been enabled to run 2000 in. into our Alta reservoir, which would otherwise have gone past us. In the various claims we have been washing and working as follows—Baker Claim: Owing to the narrowness of our opening, we have only been enabled to wash about six hours per day, the balance of the time being consumed in the removal of boulders and in blasting up the face of the bank over the incline. We have, however, washed off nearly all the gravel loosened by the three small blasts of which I had heretofore written, and by so doing have extended the north side of our 'A' pointed pit to the solid gravel. The point of our pit is within about 70 ft. of the shaft. We have one powder drift on the south side of the pit completed, and one on the north side, which is nearly finished, both of which I intend to explode within a few days. We can then wash on one side while working on the opposite, and *vice versa*, which will enable us to use water more constantly.—Star and Union Claim: Here we are washing off the slide referred to in former letters. I intend to strip off nearly all the barren slide before washing any of the pay gravel. We have run this claim alternately with Baker claim, the water doing good execution.—Pacific Claim: Before we commenced washing in this claim we had a similar mishap to one which occurred at the opening of last season—a portion of the tunnel caved in, which it was necessary to repair before commencing to wash, and after that time it was necessary to do some dead work, which we could not do without water—mentioned in my last. As a consequence we have been able to wash but a few hours each day. We expect, however, by the 13th inst. to be ready to begin running day and night, and do not anticipate any delay thereafter till the run is completed. The Central continues washing day and night.—Gold Run Claim: We have been enabled to wash but a few days in this claim. There has not been enough water passing down Canon Creek this season to cut out the tailings at its outlet sufficiently to permit it to clear without the aid of the tailings from some other claims. As no other claims above it have been running steadily, this one has been enabled to wash but a portion of the time. It is supposed that the tailings from the Pacific will keep the Canon flume clear, in which case we will soon be able to run constantly.—Water Sales: Our water customers continue using water as enumerated in my last." That, gentlemen, puts us in possession of the latest information which we have from the mines. You are aware, for it has been intimated to you, that the Yankee tunnel has been completed up to the Baker shaft. It was the intention of your directors to continue that tunnel up to Deep shaft, but there has recently been purchased—and it is a very important fact to call your attention to—the Michigan claim, which consolidates the whole of the company's property from Baker shaft up to Deep shaft—an area of possibly from 200 to 300 acres. At all events, we know that to continue the Yankee tunnel up to Deep shaft would be a distance of 900 ft. Now, instead of driving the Yankee tunnel up to Deep shaft, which it was necessary to do before any great results could be expected to accrue to this company from the Baker claim, we have now a face of at least 500 ft. in width all before us which we can wash away provided we have the water supply, without waiting to drive the Yankee tunnel up to Deep shaft. Not but what it may be necessary by degrees to carry up the Yankee tunnel to Deep shaft, but there is no necessity for us to do it for our present operations, having a vast face of gravel now before us, which is comparatively narrow, but which is being widened out by a cross drift, and where we can have a face of some 50', and use an immense body of water. That is a very important fact to call your attention to, for we had been led to expect that little good results could be arrived at by this company until we had the Yankee tunnel completed to Deep shaft. We have other claims, which you see mentioned in this letter of Col. Ludlum, that we are at present working on, but these are comparatively unimportant or minor points of attack compared to this main work of working on the Baker claim, which is now available to us, and from which we expect great results, inasmuch as we have the blue lead or bottom bed of gravel to work upon, together with the whole of the superabundant mass. So that after working a number of years to get this concern into proper working condition we have at last a fair prospect of seeing our hopes realised by having an unbroken field of operation to bring our energies to bear upon. The supply of water to these claims is, you all well know, very large during the season, running about 6000 in., or about as great as—rather more, in fact—than the volume of water brought into London by the New River. There is, however, one link in the chain that is wanting to make this a more continuous and a greater property, and that is the increase of our reservoir or water storage accommodation. Col. Ludlum has promised to send us a detailed report with recommendations on this head; they have not yet come to hand, but when they do, if the board consider them of sufficient importance, which no doubt they will, they will be printed and sent round to all of you. We know this—at a comparatively small cost, taking into account the large outlay already made upon this property, we might have greatly increased storage accommodation for water. Your directors have had this question before them on many occasions; they have considered it very seriously, and if they could by any possible means have diverted the money, or a portion of the money, which has lately been raised, to that purpose it would have been done; but the driving of the Yankee Tunnel was a matter of life or death to us—it was a question of our very existence the getting up of that tunnel to the Baker shaft, and to secure all those beds of ground whereby we have an unbroken chain of mines and of ground up to the deep shaft. And that being our aim and object to accomplish, and not to try to do that at which we might possibly break down—two things of great magnitude at the same time—we thought it much more important to complete the Baker Tunnel to this point. That end has been accomplished, and it will now be our object to increase the storage of water at a very early period. Gentlemen, you have undoubtedly had to exercise great patience in this company, and your directors have had a very heavy work to pull through. Theirs has been very far from a bed of roses, but it is something to tide the vessel safely through the storm and into a prospect of a quiet haven, and there is certainly a better prospect before us of seeing daylight than we have ever had for certainly some years past. There is on the question of accounts one matter to which I must call your attention. As to the accounts themselves, I may say that they are truly and accurately rendered to you, they speak for themselves, and no explanation of mine could make them any better, nor by any enquiries could they be found to be worse—they are just what they appear to be. The point I wished to mention was this—We have a mortgage in California of about 10,000*l.*, which is the only mortgage upon the property. It may be desirable to have that mortgage brought here to this country instead of continuing it out there, for if there is any advantage in the rate of interest our shareholders ought certainly to have it, and it should not be given to the Pacific Coast men, to whom I fancy we certainly owe nothing, whereas we owe a consideration to look to ourselves, and ourselves purely and simply. (Hear, hear.) On the question of directors, during the past year we lost the valuable services of Mr. Rotch, barrister-at-law, and a gentleman always most useful to us, and attentive to our interests, but who from business engagements was obliged to retire from the board. Mr. Gallup also tendered the same explanation, and sent in his resignation. In their place two gentlemen have been elected—Mr. Chadbourn and Mr. Clementson. Mr. Chadbourn is of very great use to us, as he is intimately conversant with everything relating to our property. His partner is now out in California, and he has promised to visit the mines, and send us a detailed report thereon, which we shall at once place in the hands of the shareholders. I cannot conclude without reference to another of our colleagues, Mr. Briggs, a gentleman to whom we owe much; I might almost say the company owes its existence to him, for he has come to the rescue not only with money but with his valuable personal attention and services in every possible way. He is here to-day, at much inconvenience to himself, and when I tell you that he comes up from Yorkshire to attend your meetings, and when I further tell you that for years past your directors have had neither fee nor reward, you will acknowledge that it is something to have gentlemen of high commercial experience and ability like Mr. Briggs at the head of affairs. He has put his own money in, and put his friends' money in, and he stands like a true Britisher with his back to the wall, determined to fight the matter fairly

and fully out. (Hear, hear.) He has, I may add, been in communication with Colonel Ludlum, and has received a letter from him, and I should like to call upon Mr. Briggs to read that letter to you. Gentlemen, I beg now to move, "That the directors' report and balance-sheet as circulated among the shareholders be received and adopted."

Mr. H. C. BRIGGS said: Gentleman, I have much pleasure in rising to second the resolution which has been put by our Chairman. I agree with much that he has said, but still I think that he hardly puts sufficient value on the prolongation of Yankee Tunnel to Deep shaft. I do not despair of that by any means, and I do not think any shareholders ought to despair of accomplishing that most requisite completion of our work. As you are aware, Colonel Ludlum, in all his reports for several years past has stated that very large returns could not be expected until Deep shaft was reached, and certainly the result has fulfilled what he warned us of. The result of the last year has certainly been a great disappointment to myself, who joined the board only about a year ago, and must be so to all our shareholders, because we hoped for better results. The reason of the poor result is explained very fully in Colonel Ludlum's report, and has been explained still more fully in other letters which we have received from him in regard to the large clay slide, which seems to have slipped down the hill and covered the claim, so that we have not reaped the results we expected. Our Chairman has alluded to something I have received from our manager at the mines. I wrote him at the time I joined the board telling him that I was taking steps to raise some additional capital, which I succeeded in raising, and of which about 8299*l.* was paid in up to Dec. 20 last, and sums have been paid in since that date, and there is something like 1500*l.* still available for carrying on the work. Now, some of my friends made a stipulation that that which they subscribed should be exclusively used for the increase of reservoirs for the storage of water, and accordingly at that time I wrote to Colonel Ludlum to say that this was the express condition on which a certain sum was subscribed. I am sorry to say that up to the present time we have not received that promised report which Colonel Ludlam said he would send us as to this point. However, in this letter which I received from him, under date Jan. 28, he writes:—"Our distributing ditches are now in splendid working order. We have the patronage of all the good water customers who purchase water in this section. Our water sales will be larger than ever before, provided we have a supply. This portion of our property is now in condition to be as productive as it ever will be, till we prolong the seasons by the construction of mountain reservoirs. In the Baker claim we are nearly within reach of the solid undrifted gravel, which I am confident will pay well, though not so largely as the Deep shaft. I really think that our outlook is very encouraging, and am anxiously awaiting the opening of the washing season." The value of the water property, I think, is undeniable. Very recently the value of the water property of that description has been shown by the purchase of the Yuba Canal by Mr. Hayward for 8510,000, and that proves the value of a supply of water alone, for the property I allude to did not comprehend any mines at all, it was merely just the power of getting a water supply. Well, we have a water supply only second, perhaps, to the Yuba Canal—that alone gives a backbone to the company, which I do not think other companies possess, and that gives me, as one who has advanced a very large proportion of the 8 00*l.* subscribed during the year, great confidence that although our report this year is not so satisfactory as might have been hoped for, still we have such security in the value of the property itself that we shall eventually reap the benefit of the whole of our expenditure. I have great pleasure in seconding that the directors' report and balance sheet, as circulated amongst the shareholders, be received and adopted.

The CHAIRMAN: Undoubtedly Mr. Brigg's remarks with regard to the continuance of the Yankee tunnel are deserving of the greatest attention and consideration. It is the desirable thing to do. The driving of that tunnel ought to be accomplished within a year if we had the means to carry it on. It will not be a very expensive operation. Colonel Ludlam tell us that at Deep shaft the gravel is richer than at any other part of the property, and far above the richness of other gravel mines; hence it is most desirable that we should reach that point, and that as quickly as possible. The driving of the Yankee tunnel and the increase of the storage water accommodation are the two points which ought to be attacked, and which are of immense importance to the future of the company. At the same time, we may, I think, congratulate ourselves upon the statements which had been read to us that the present prospects of the property are better than they had ever been. (Hear.)

Mr. CHADBURN: There is one point which I think seems to give as good proof as any that we ought to make money out of this property—all the ground from which we have hitherto derived our returns has been drifted ground, but henceforward we shall work on untouched ground.

The CHAIRMAN: I may explain, gentlemen, that drifted ground means ground previously worked. This great gravel deposit of from 100 to 300 ft. in thickness has been worked at the bottom, and taken away to the depth of some 7 ft., showing that this ground has been sufficiently attractive for men to work at it like a seam of coal. Now, however, we are entering upon undrifted ground, and we have a better chance than ever of getting large returns. We have (driven the Yankee tunnel—our main tunnel with branches—a distance of 2200 ft. That was an absolutely necessary work to get through before we could wash down this great body of gravel; and but for that we should have to have gone on like our predecessors had done, bringing it out by pure mining operations, with of course very small results for our labour. But now we have the whole face of the deposit before us, and can work at it with the greatest possible advantage.

A SHAREHOLDER: Is it possible to estimate roughly the cost of carrying on the tunnel to completion, and the cost of making adequate reservoirs?

The CHAIRMAN: The total cost of sinking the shaft and driving the tunnel the remaining 900 ft. would be under 5000*l.*

Mr. BRIGGS: In exact figures 475 *l.*

The SHAREHOLDER: And to increase the reservoirs?

The CHAIRMAN: We have not yet received Colonel Ludlum's report on this subject, but we estimate the cost would be about 1500*l.* to 2000*l.* The figures are not large; there are no impossible and gigantic means required; but when you have no money even a small sum seems great.

The resolution for the adoption of the report and balance-sheet was then put and carried unanimously.

The CHAIRMAN begged to move "That Messrs. G. B. Jennings and C. J. St. Alphonse, directors retiring by rotation, be re-elected."

Mr. BUTTERWORTH seconded the resolution, which was then put and passed unanimously.

Mr. HALLS moved that Messrs. Good, Daniels, and Co. be re-appointed auditors to the company.

Mr. HILL seconded the resolution, which was then put and carried unanimously.

On the motion of Mr. HILL, a vote of thanks was accorded to the Chairman and directors for their zeal and attention to the conduct of the company's affairs during the past year.

The CHAIRMAN, in acknowledging the compliment, expressed the hope and belief that at their next meeting the directors would be enabled to communicate more cheerful and satisfactory results.

The proceedings then terminated. ——

COLORADO TERRIBLE LODE MINING COMPANY.

A special general meeting of shareholders was held at the company's offices, 21, Great Winchester-street, yesterday,

Sir CECIL BEADON in the chair.

The notice calling the meeting was read by Mr. F. ANDREWS, the secretary.

The CHAIRMAN said the shareholders who were present at the general meeting last summer would remember that the board were about to send Mr. Andrews, the secretary, to Colorado, with the view of seeing if some settlement could be come to with Mr. Hamill, the owner of the mine adjacent to this company's property, with whom the company had been in litigation for some time past, and which litigation there was little prospect of bringing to a satisfactory termination. Shortly after the meeting Mr. Andrews went to Colorado, and was absent nearly six months. Many circumstances occurred to prevent the progress of negociations out there. First of all, the gentlemen chiefly concerned—Mr. Hamill and Mr. Chaffee—were American politicians, and were interested in the elections to the different offices in the new State of Colorado, and subsequently in the presidential election, therefore a considerable period elapsed before Mr. Andrews was able to bring those gentlemen to make any proposal which was at all likely to be acceptable to the shareholders. But Mr. Andrews was not unoccupied when he was there, because he was able, in conjunction with Mr. Henty, to effect a lease of some neighbouring mines, which the company had been working during the summer at a fair profit, which had enabled the directors to carry on the company without getting into debt, to pay the current expenses, and carry on the war without calling upon the shareholders to assist. Moreover, the mines of which they had obtained leases were likely to be a source of some real profit hereafter. Before referring to the real proposition which had been made by Mr. Chaffee and Mr. Hamill, he would remind the shareholders that Mr. Chaffee was in England last spring, and made a proposal to the directors to sell to the company the entire property of himself and Mr. Hamill for 80,000*l.*, part in cash and part in debentures. Now, any proposal for a purchase in cash was out of the question, and, therefore, the directors informed Mr. Chaffee that they were not prepared to recommend the shareholders to come forward with any cash offer. As regarded the debentures, the directors considered the matter very carefully, and came to the conclusion, taking Mr. Henty's report of the value of the property, that the utmost amount they could recommend the shareholders to pay for this property in the form of debenture was 60,000*l.* The directors had a good deal of conversation with Mr. Chaffee, and Mr. Chaffee said that for his part he was will to take 20,000*l.* in debentures for his own share of the property, and would do his best to induce Mr. Hamill to take 40,000*l.*, making 60,000*l.* altogether; but when Mr. Chaffee got back to America Mr. Hamill refused to be a party to such a transaction, and stuck out for 60,000*l.*, making 80,000*l.* The directors thought 80,000*l.* in debentures was too much to be paid off in two years, and that possibly the company could not fulfil the terms of their agreement, and that the mortgagees could take possession of the property. When Mr. Chaffee was in England he (the Chairman) suggested something of the nature of that which was now about to be proposed—an amalgamation of the companies, upon the basis of their taking shares in the company, which was very much like the plan which was now submitted. Well, Mr. Chaffee said he was not unwilling to negociate on such a basis, but in that case would at once put down his property as upon an equality in value with the Colorado Terrible property. He (the Chairman) asked Mr. Chaffee to consider the position of the company, which was an English joint stock company, having a quotation here, and it was not fair to put the properties down at an equal value, that if the company's property was worth 100 000*l.*, the other should not be value at more than 50,000*l.* The matter ended, and Mr. Chaffee went to America. After Mr. Chaffee's return to America a letter was received by the board, signed by Mr. Hamill and by Mr. Moffat, the agent of Mr. Chaffee; and after some correspondence the proposal now to be submitted was agreed upon. That was all the information which the directors possessed upon the proposal now submitted, and he must conclude what he had to say by strongly advising the shareholders, entirely in their own interest, to adopt the arrangement to which the board had come with Mr. Hamill. The state of the lawsuit was this—that the hearing of it had been postponed at the instance of Mr. Hamill to July; in the meantime Mr. Chaffee had been elected a senator of the United States for Colorado, and Mr. Hamill had been elected a member of the Local Legislature, and the power of these two gentlemen, which had been considerable before, had become greater now, and it would be fatal for any English company to attempt to carry on litigation with persons in power there. The company had a little money in hand, but even supposing they were likely to obtain justice by an appeal to the Courts of the United States, the company had not the means of carrying on the litigation, which would probably occupy five years. Therefore, the sooner the shareholders come to an arrangement the better it would be for the property, and the better for themselves. The mine was practically reduced to the extent of 700 ft., and the valuable shoot of ore which they had been working when the operations were stopped two years ago was gradually trending to the westward, and going out of the company's property into the property which was owned by Mr. Hamill under the name of the Silver Ore Lode. Again, Messrs. Hamill and Chaffee owned mines which were covered by patents from the United States, and others for which patents had been applied for, and which they obtained to the extent of 838,000. Therefore, the property of Messrs. Chaffee and Hamill was worth ten times as much as the property of the Colorado Terrible Company. On the other hand, the Colorado Terrible Company occupied a very advantageous geographical position, and the other property could only be advantageously reached by the prolongation of this company's tunnel. If the property were put into one common purse it was not an excessive proportion to give Messrs. Hamill and Chaffee two-thirds, and for the company to keep one-third, or a little more, for themselves.

A SHAREHOLDER asked what money they had in hand, and what amount would be required to develope the property?——The CHAIRMAN said the company had still in hand about 3000*l.*, and a profit was being made out of the leased lines, and no doubt if this proposition were carried out Messrs. Hamill and Chaffee would forego their objection to the issue of debentures, and if that were the case there certainly would be no difficulty in raising money on the debentures.

A SHAREHOLDER thought that the provision of one vote for each share was unreasonable, as it had given a great preponderance of power into the hands of Mr. Chaffee and Mr. Hamill.

The CHAIRMAN said that as the two gentlemen alluded to put two-thirds of the property into the common pot, it was only fair that they should have a proportionate amount of voting power. He pointed out that the interest of Messrs. Hamill and Chaffee was to improve the value of the property in every way, and not to hinder the successful working of the mines. He might also mention that if this agreement were carried out those gentlemen had agreed to give the company a good title to all the mines.

Mr. HARRIS, barrister, who visited the district last summer, expressed his opinion that the proposal was one which it would be to the advantage of the shareholders to accept. He had great confidence in the ability and integrity of Mr. Henty.

The following resolution was then put and carried:—

That in pursuance of Article 44 of the Articles of Association, the directors be authorised to increase the capital of the company from 125,000*l.*, the amount mentioned in the Memorandum of Association (but of which 105,00*l.* only has been actually issued) to 325,000*l.*, by the issue of 40,000 new shares of 5*l.* each in addition to the 4000 shares remaining unissued of the original capital as aforesaid. And that the directors be further authorised to allot 40,000 of such new shares to William A. Hamill, of the town of Georgetown, in Clear Creek county and State of Colorado, and Jerome B. Chaffee, of the City of Denver; the shares to be allotted as aforesaid to be considered as fully paid up, and to be taken by the said William A. Hamill and Jerome B. Chaffee in satisfaction of the purchase moneys agreed to be paid to them for all their mining property on Brown and Sherman Mountains in the aforesaid Clear Creek county, and all claims and demands in respect thereof. And that the directors be further authorised to dispose of the 4000 shares remaining unallotted of the original capital as they may think fit for the purpose of providing working capital, without offering the same to the members as provided in Article 45.

That the regulations of the company contained in the Articles of Association be altered as follows:—In the heading of the Articles of Association and in the form of transfer set out in Article 21, the title "The Colorado United Mining Company (Limited)," to be substituted for "The Colorado Terrible Lode Mining Company (Limited)," if such change of name shall be approved of by the Board of Trade. In Article 63 the words from "every member" in the first line to the words "25 votes" in line four to be omitted, and in lieu thereof the following words to be substituted "every member shall have one vote in respect of every share held by him." In Article 70 the word "eight" to be substituted for "five"

A cordial vote of thanks was then passed to the Chairman, directors, and to Mr. Andrews.

The CHAIRMAN, in acknowledging the compliment, bore testimony to the able way in which Mr. Andrews had conducted the negociation, and said that that gentleman is about to start for Colorado to conclude the arrangement. A meeting to confirm the above resolutions will be held on Wednesday, March 28, at twelve o'clock.

WEST GREAT WORK MINING COMPANY.

The adjourned special meeting of shareholders was held at the company's office on Wednesday (Colonel HODGSON in the Chair). The notice convening the meeting and the minutes of the previous meeting having been read, the Chairman stated that the meeting was held in conformity with a resolution passed at a previous special meeting, and that he would simply put before the shareholders the result of the application recently sent out, and then ask them to further adjourn the meeting, in order to ascertain the determination of each individual shareholder. It was necessary that at least 1500*l.* should be subscribed to ascertain and prove the lode running into West Great Work from West Godolphin Mine, which is very rich for tin. This would require subscriptions for 1500 of the unallotted shares; and, as an inducement to applicants, bonus shares are offered, one section of the shareholders surrendering a portion of their holdings in order that the directors may effect this; the number of shares surrendered up to this moment being 816, and the number applied for being 233, besides this, the promises having been made conditionally, while the numbers would in each case be increased by the shareholders present. Before putting a resolution, Capt. Reed, the agent, is present, and will be glad to give any further particulars as to the prospects of the mine.——Capt. REED: The mine is looking better as we near the Godolphin lode, at the 15. We require capital first to ascertain the position of this lode as it comes into our mine, and if it is as rich in West Great Work, we have a paying mine at once, even with our present workings of tin at 60*l.* per ton we should pay costs.

A SHAREHOLDER: How long will it take you to reach this point, and what amount will you require for that purpose?——Capt. REED: It will take about eight months, and the cost would be about 400*l.* to 500*l.*, depending, of course, upon the nature of the ground.

The CHAIRMAN; You will want 2000*l.*, but I understand 1500*l.* would be sufficient to determine whether these rich deposits exist in our mine.——Capt. REED: Yes; about 500*l.* to ascertain the position of the lode, and the balance to sink the necessary shafts upon it.

A SHAREHOLDER: Should Capt. Reed be disappointed in meeting with this lode, what then?——Capt. REED: We have another point in the mine which is looking better, and with tin at 60*l.* we can pay costs. We have already ascertained the position of a few lodes. Great Work Mine, adjoining, has been working over 60 years, and returned something like 1,000,000*l.* of tin.

The CHAIRMAN: I think we are now in possession of all the information we require, and I will call upon the secretary to report the exact result of the applications to the shareholders.——The SECRETARY stated that the number of shares applied for and surrendered, inclusive of those present, were as follows—Shares surrendered, 1116; shares applied for, 425. Beyond this there were other conditional applications.

The CHAIRMAN: Gentlemen, there are a good number of shareholders in West Great Work, and it is possible that those who have left our applications unnoticed may act upon it when reminded by another circular. There are also others in arrears of call, and I would ask you that those shares be forfeited, and that this meeting do adjourn till Wednesday, March 28.——The resolution to adjourn was then put, and carried unanimously, and the secretary instructed to call a special meeting on the same date to forfeit all shares in arrear of call or calls.

BLUE HILLS MINING COMPANY.—At a general meeting of adventurers, held at the offices of the company, on Thursday (Mr. Chester Cheston in the chair), the minutes of the last meeting were read, confirmed, and signed. The financial statement for 16 weeks, charging costs to end of December, showed a debit balance of 781*l.* 18*s.* 10*d.* The agent's report having been read, it was resolved that the accounts, with the agent's report then read, be received and passed, and a copy forwarded to each adventurer. A call of 2*s.* 6*d.* per share was made. A vote of thanks to the Chairman terminated the proceedings.

PENHALLS.—At a general meeting of adventurers, held at the offices of the company, on Thursday (Mr Chester Cheston in the chair), the minutes of the last meeting were read and confirmed. The accounts for the 16 weeks, charging cost to end of November, showed a credit balance of 45*l.* 19*s.* 9*d.* The agent's report having been read, it was resolved "That the accounts, with the agent's report, be received and passed, and a copy forwarded to each adventurer." It was then resolved "That the mine further contribute 20*l.* per month for three months towards the working cost of Blue Hills engine." A vote of thanks to the Chairman terminated the proceedings.

[For remainder of Meetings see to-day's Supplement.]

THE CHAPEL HOUSE COLLIERY COMPANY.—The celebrated Park Mine has been cut in the 16-ft. pit, at a depth of 388 yards from the surface. It has been found 5 ft. 10 in. thick, and without parting; in fact, the seam yields 5 ft. 10 in. of solid coal. The finding of this seam is of the utmost importance, as not only is the coal of superior quality to anything yet worked in the colliery, but it has been found at a depth of 20 yards less than was originally held out would be the case. The coal is bright and clean, yields a little brown ash, is hot, and yet slow in burning; in fact, it is about as fine a household coal as need be wished for. I visited the colliery last week, and went down the pit myself. I was much pleased with the appearance of the seam, and particularly in noticing the strong metal or rock above and below the coal, and which will greatly facilitate the working. The pit has been sunk 7 yards below the seam, so as to drain any water there may be, and the arching for the mouths of the levels into the coal is now being built. The sinking of the 15-ft. pit (down 179 yards deep) will be continued at once, with a view to reaching the Park Mine, and assisting in the ventilation of the works as soon as possible. Brickmaking will, probably, be recommenced at the end of next month. With regard to the trade, it is as well to state that the colliery is still making a profit of about 1*s.* 6*d.* per ton, at a time when most others are making a loss. There is no lack of orders for the coal, as will be understood from the fact that, besides working the colliery full time, and getting as much coal as possible from it, there were last month purchased about 3000 tons to supply the customers, who are being kept together in view of the enlarged output which it is hoped will soon be obtained. The output is now about 300 tons per day, but the manager says he shall have no difficulty in raising and selling the 1000 tons per day which it is proposed to obtain.—*Thompson's Investment Circular.*

STENTOR DISTANCED.

The Boston Globe of Feb. 13 publishes the following special despatch, which it received from Salem, 18 miles distant, by telephone: "Professor A. Graham Bell, the inventor of that wonderful instrument the telephone, which has caused so much interest in the scientific world, and which is now becoming so popularly known, lectured on his invention at Lyceum Hall. The lecture was one of a course of the Essex Institute, and about 500 persons were present. The lecture was very well received, and the frequent and long-continued applause showed that the audience appreciated fully the wonderful uses and the experiments made with the machines. Prof. Bell briefly explained the construction of the instrument, and then sketched his studies of the system of transmitting sounds. He explained that it was his first attempt before an audience to try these different experiments. An intermittent current was first sent from Boston by Mr. Thomas A. Watson, Professor Bell's associate. This caused a noise very similar to a horn from the telephone. The Morse telegraph alphabet was then sent by musical sounds, and could be heard throughout the hall. The audience burst into loud applause at this experiment.

A telephonic organ was then put into operation in Boston. "Should Auld Acquaintance be Forgot" and "Yankee Doodle" were readily heard through the hall, and heartily recognised. At this point Prof. Bell then explained how he learnt to transmit the tones of the human voice, and paid a grateful tribute to Mr. Watson. Prof. Bell asked Mr. Watson for a song, and "Auld Lang Syne" came from the mouthpiece of the instrument almost before his words were ended. Mr. Watson was then asked to make a speech to the audience. He expressed himself as having more confidence 18 miles away than if he were present. His speech was as follows:—"Ladies and Gentlemen, it gives me great pleasure to be able to address you this evening, although I am in Boston, and you in Salem." This could be heard 35 ft. distant—that is, all over the hall—and brought down the house with applause. A system of questioning was then carried on, and Mr. Watson was asked if he heard the applause. The answer was—"I was not listening; try again." The applause was given, and its receipt at once acknowledged in Boston. Coughing and singing were then heard, and a variety of questions were then asked from the Salem end, and among them—"What news from the Electoral Commission?" followed by the distinct answer of—"I don't know of any." But the news came fleeting along that the engineers of the Boston and Maine Railroad had struck. Gen. Cogswell asked if trains were running; the answer was clear and distinct that they were not at 5:30 o'clock.

Prof. Bell introduced the Rev. E. C. Bolles, who said, "I shake hands with you cordially, in imagination, 20 miles away." The Rev. E. S. Atwood asked, "Does it rain?" "It does not in Boston," was Mr. Watson's answer. Prof. Gage, the electrician, then spoke through the telephone, endeavouring to have his voice recognised. This could not be done, as Mr. Watson was not familiar with the voice. Mr. Shaje Zsawa was recognised, Mr. Watson being perfectly familiar with his tones. One of the assistants in Boston then said that "Hold the Fort" would be sung in Boston, and the tune which followed was readily recognised. Prof. Bell closed his lecture by briefly stating the practical uses to which he was confident the telephone could be applied. Hearty applause was afforded the lecturer as he finished, and people flocked about the stage in large numbers to more closely examine the wonderful instrument that had placed them in audible communication with people nearly 20 miles away.

The Boston Globe adds—"The instrument which transmitted the wonderful voice-message to the listening ears in this city (Boston) was placed in a little room in Exeter-place, where were assembled Prof. Watson, Benjamin Bridden (the electrician), Prof. E. B. Warman, and Mr. A. B. Fletcher, representative of the Globe. The experiment was certainly a great success. The conversation with the friends 18 miles away was carried on in ordinary tones of voice. The Globe representative in Boston very easily recognised the voice of the transmitter of the despatch in Salem, and very distinctly heard the applause which was given in the Essex Institute Hall.

LEAD ORES.

Date.	Mines.	Tons.	Price per ton.	Purchasers.
March 1	—Kingston Consols	7¾	£17 18 0	Treffry's Estate.
—	ditto	3½	12 17 6	ditto
5	—Great Laxey	100	24 7 6	Weston, Son, and Co.
—	—Caldbeck Fells	15½	14 17 6	South Wales Smelt. Co.
—	ditto	4¼	9 15 0	ditto
6	—Rookhope	30	13 8 9	Jacob Walton and Co.
7	—Frank Mills	50	10 7 6	South Wales Smelt. Co.
8	—Talargoch:—			
	Maesyreddue	60	14 17 6	Walker, Parker, and Co.
	Coetia Llys	40	15 0 0	ditto
	—Gorsedd & Merllyn.	50	15 16 6	A. Eyton.
	—Pennant	20	13 12 6	Walker, Parker, and Co.
	—Prince Patrick	20	14 6 6	ditto
	—Rhydalun	5	13 13 0	ditto
	—South Merllyn	8	12 17 6	ditto
	— ditto	8	13 10 6	A. Eyton.
	—Llanrhaiadr	10	13 14 0	Nevill, Druce, and Co.
	—Van	150	14 13 6	Walker, Parker, and Co.
	— ditto	50	15 0 6	Weston, Son, and Co.
	— ditto	50	15 1 6	St. Helen's Smelt. Co.
	— ditto	50	14 15 6	ditto
	— ditto	100	15 0 6	A. Eyton.
	— ditto	100	15 17 6	South Wales Smelt. Co.
	—West Tankerville	35	14 7 6	Burry Port Company.
9	—Leadhills	100	13 13 0	Walker, Parker, and Co

BLENDE.

Date.	Mines	Tons.	Price per ton.	Purchasers.
March 1	—Kingston Consols	22½	£ 5 6 6	Dillwyn and Co.
—	ditto	22¾	3 16 6	ditto
7	—Talargoch	75	4 4 6	Vivian and Son.
—	ditto	75	4 4 6	Dillwyn and Co.
8	—West Tankerville	20	4 9 0	Swansea Vale Co.
	—Van	100	4 2 6	Kenrick and Son.
	— ditto	100	4 0 0	ditto

BLACK TIN.

Date.	Mines.	Tons c. q. lb.	Price per ton.	Amount.	Purchasers.
March 3	—Pedn-an drea	9 4 0 27	£43 10 0	£400 14 6	—Carvedras.

COPPER ORES.

Sampled Feb. 21, and sold at Tabb's Hotel, Redruth, March 8.

Mines.	Tons.	Price.	Mines.	Tons.	Price
Mellanear	92	£3 0 6	West Tolgus	40	£6 17 6
ditto	85	3 15 0	South Croity	71	2 15 6
ditto	60	3 18 0	ditto	61	2 12 6
ditto	51	7 15 6	ditto	50	2 14 0
ditto	45	3 2 6	East Pool	58	3 15 6
West Seton	74	3 16 6	ditto	31	3 12 0
ditto	71	4 0 6	ditto	18	6 0 0
ditto	60	4 10 6	South Carn Brea	64	4 0 6
ditto	52	4 18 0	Carn Brea	33	4 3 6
ditto	43	4 4 0	ditto	25	2 4 0
ditto	17	2 16 0	Wheal Grenville	10	6 19 0
ditto	13	4 4 0	Wheal Agar	7	5 1 0
West Tolgus	71	6 11 6	East Grenville	6	0 18 6
ditto	63	2 18 6	Carn Camborne	4	1 0 0
ditto	61	6 11 6			

TOTAL PRODUCE.

Mellanear	333	£1368 4 0	Carn Brea	58	£ 192 15 6
West Seton	330	1376 1 6	Wheal Grenville	10	69 10 0
West Tolgus	235	1453 3 6	Wheal Agar	7	35 7 0
South Croity	182	492 3 0	East Grenville	6	5 11 0
East Pool	107	438 11 0	Carn Camborne	4	4 0 0
South Carn Brea	64	257 19 0			
Average standard		£101 9 0	Average produce		6¼
Average price per ton					£4 5 0
Quantity of ore		1335	Quantity of fine copper 92 tons 6 cwts.		
Amount of money			£5592 18 6		

NO SALE on Thursday next, March 15.

Copper ores for sale at the Royal Hotel, Truro, on Thursday week—Mines and parcels.—Devon Great Consols 820—South Caradon 470—Marke Valley 380—Gunnislake (Clitters) 297—Glasgow Caradon 240—Hingston Down 188—Brookwood 185—Bedford United 156—East Caradon 115—West Maria and Fortescue 104—Wheal Russell 70—Wheal Curnow 40—Okel Tor 10.—Total, 3025 tons.

*** The complete Ticketing will be published in next week's Journal.

Mining Correspondence.

BRITISH MINES.

ABERDAUNANT.—S. Toy, March 7: We are cutting the new shaft down towards the deep adit level as fast as possible. In the east part of the sett (Crowlwm) in the cross-cut driving towards the new lode we have met with another breast-head 18 in. further south than the one we met with last week, and it is of the same bearing and underlie. The ground inside this head is a little harder, and very wet, which makes me think we are very near the lode.

ASSHETON.—John Craze, Joel Manley, March 8: Setting Report: The 80, east of boundary shaft, has been set to four men to drive, at 13*l.* 5*s.* per fathom; this end is now in about 12 fms., the lode is large, composed principally of spar and blende, but nothing to value. The 60, east of boundary, is now extended about 43 fms.; set to six men to drive, at 8*l.* per fathom. We have this day put men to cross-cut south, to prove whether there is any more lode standing south, as we have seen some branches going off in that direction. The 50, east of Mawr shaft, stent not out—16 fms., or to cut the north and south lode, at 8*l.* 10*s.* per fathom; no lode has been taken down here since our last, but we purpose doing so in the course of another week. We calculate that we have from 4 to 5 fms. more to drive to intersect the north and south lode, where we anticipate a good discovery. The stope in back of the 50, west of Mawr shaft, stent not out, at 3*l.* 15*s.* per fathom, by six men; lode worth 10*l.* per fathom. The stope in bottom of the 40, west of Browne's shaft, is set to four men, at 3*l.* 17*s.* 6*d.* per fathom; lode here is worth 12*l.* per fathom. We have set the following tribute pitches for lead ore—two men in back of 40, east of boundary shaft, at 6*l.* 10*s.* per ton; two men in back of 40, west of Browne's shaft, at 8*l.* per ton; two men in back of 30, west of Browne's shaft, at 7*l.* 10*s.* per ton; two men in back of 30, west of Maur shaft, at 8*l.* per ton; two men in bottom of 30, west of Maur shaft, at 8*l.* per ton; two men in back of 20, west of Maur shaft, at 8*l.* per ton; two men in back of 20, east of Maur shaft, at 8*l.* per ton. We purpose sending out samples for the sale of 30 tons of lead ore next week. In conclusion, we would advise a cross cut to be driven south at the 30, east of Maur, to intersect the south lodes known to exist in that direction, where there is every probability of making a good discovery.—West Assheton: The 80, to drive west of boundary shaft, is set to six men to drive, at 8*l.* 5*s.* per fm. This end is now extended about 22 fms.; the lode is 1½ ft. wide, composed of spar, blende, and spots of copper, mundic, and lead. The 60, west of boundary, has been set to six men to drive, at 5*l.* 10*s.* per fathom; this end is now extended about 48 fms. The lode in the present end is fully 3 ft. wide, composed of spar, blende, and lead of a very promising character. We have four men stripping down the lode in the side of this level, at a point 25 fms. from the shaft, where the lode is worth 10*l.* per fathom. We have set the 40 west to two men to drive, at 3*l.* 10*s.* per fathom; the lode here is from 2½ to 3 ft. wide, producing stones of lead and blende of a very kindly character. A pitch in back of this level has been set to two men, at 6*l.* 10*s.* per ton for lead.

BODIDRIS.—H. Hotchkiss, March 7: There is no material change in the 45 yard level east or in the rise in back of this level since my last. Both places still maintain their favourable characters. The same remarks will suffice for the 60 east, on main lode, only that better progress has been made in this driving during the past week. The cross-cut going south for Maes-y-pwll lode is showing signs of a more favourable ground to-day; the joint which has been close is now opening out again, which will enable us to make better progress. The 30 to cut south part of the lode. I am sorry to say we have not as yet met with anything important; if not successful in a few more days I shall put the men to drive upon the north part of the lode again. Dressing department going on regular. No other change in the vein. Weather here to-day is very tempestuous.

CALDBECK FELLS.—J. Polgrase, March 2: The lode in the drivage east, in the back of the 80, is worth 15*l.* per fathom. The stope in the bottom of the level is worth about 15*l.* per fathom. The stope in the back of this level is worth 25*l.* per fathom. Nothing new to notice since last report.

CATHEDRAL.—J. Michell, March 3: Setting Report: The shaft is sunk to the 52 fm. level; we have set to drive east and west on the lode, to three men and three boys each end, at 8*l.* per fathom. The lode in the east end is 3½ ft. wide, and in the west 2½ ft. wide, producing good stones of ore each end. The 42 end east, to four men, at 2*l.* 5*s.* per fathom; the lode is 3 ft. wide, composed chiefly of gossan of a very superior quality, with a little copper ore in it; this going in whole ground speaks well for the future. The 42 end west, to four men, at 6*l.* 10*s.* per fathom; the lode is 2 ft. wide, and will produce 1 ton of copper ore per fathom. We expect to cut the canuter lode this month, when we anticipate an improvement.

— March 5: Both bottom ends (the 52) started this morning, good ore in both, but not like we shall very shortly have—a rich course of copper ore; at any rate, judging from the levels above (the 42), I feel very satisfied that those levels started to-day will soon strike into a good and lasting course of ore. The lode in the 42 end east is fully 3 ft. wide, composed of a very rich copper gossan, green carbonate of copper, prian, and spots of gray and black ore—a very fine-looking lode indeed. The lode in the 42 end west is 2½ ft. wide, and will produce quite 1 ton of ore per fathom, with every indication of an early improvement. We are going to do well in this mine, and at an early date.

CLEMENTINA.—W. Bennetts, March 6: The engine is now down 4 fms. 5 ft.; the ground for the past fortnight has been very wet and troublesome for sinking, but I am pleased to say it is now more favourable for sinking. In the past month we have had some nice leadwork from the south end of the shaft. The 25 end has very much improved in the last 3 ft. driving; the lode is now 3 ft. wide, worth 15 cwts. of lead per fathom, and in the bottom of the end it is worth 1¼ ton per fathom, which speaks well for the next level. I have to-day sent you by rail a box of lead which I broke this morning. I estimate we have 3 tons of lead broken.

CLEMENTINA.—W. Bennetts, March 8: The lode in the 25 end south is still looking well, and I am glad to inform you that the lode at the engine shaft has improved. We have broken some nice stones of lead from the bottom of the shaft to-day.

COMBMARTIN.—C. H. Maunder, March 8: Harris's shaft is now cleared to the depth of 20½ fathoms. The last 2 fathoms we have cleared has opened out wide, and still continues to do so, and requiring timber. It appears as if it is the back of the plat, or that a piece of lode has been stoped away by the shaft. As we advance we shall shortly ascertain this, as we are daily expecting to communicate with the main level (No. 2 on this lode), where it is hoped good tribute pitches will be available. At the 15 west the lode still keeps improving, producing good quality silver-lead and blende.

CWM ELAN.—W. Goldsworthy, March 3: I beg to hand you the setting report for the next month's working, &c. The shaftmen are getting on with their contract as fast as possible. There is no change to notice in the value of the lode since last advised thereon. The 30 west, by two men, at 6*l.* 12*s.* 6*d.* per fathom. The value of the lode has improved a little during the week; worth at present 20 cwts. of lead and blende ores per fathom. No. 1 stope in the back of the 30 east, by four men, at 3*l.* per fathom; worth 20 cwts. of lead and blende ores per fathom. No. 2 stope, by two men, at 3*l.* 10*s.* per fathom; worth 15 cwts. of lead and blende ores per fathom. The stope on the north lode in the same level, by two men, at 2*l.* 12*s.* 6*d.* per fathom, worth 15 cwts. of lead ore per fathom. The No. 1 stope in the back of the 20 west, by two men, at 3*l.* 2*s.* 6*d.* per fathom; worth 18 cwts. of lead and blende ores per fathom. No. 2 stope, by two men, at 3*l.* 10*s.* per fathom; worth 17 cwts. of lead and blende ores per fathom. The stope in the same level east, by two men, at 3*l.* 12*s.* 6*d.* per fathom. We are pushing forward the next sampling of lead ore with all speed. Our machinery is in first-class working order and perfect repair. There are about 10 tons of lead and 3 tons of blende ores in the bin.

CWMYSTWITH.—March 6: In Michell's level west the lode is 3 ft. wide, worth 10 cwt. of lead ore per fathom; a nice lode.—Michell's Level East, on the New Lode: A very kindly end. The lode is 1 ft. wide, producing saving work. In Michell's cross cut north the ground still continues very stiff for driving.—The Winze in the bottom of Michell's Level West, on the New Lode: The part of the lode being taken down for 1 ft. wide is poor.—The 12 fm. Level East, on the New Lode: No lode taken down since last reported on. In the rise in the back of Rosa level, new lode, the lode is still worth 10 cwts. of lead ore per fathom. In Gill's upper level east, on the new lode, the lode is still strong and masterly, showing blende and spots of lead ore, but not sufficient to value. Our stopes and tribute pitches are looking just as usual. The weather is now favourable for surface work, and dressing is being pushed on as fast as possible.

DE BROKE.—J. Phillips, March 7: Wilson's shaft is 7 fms. 2 ft. below the 35; the part of the lode carried in the shaft produces a mixture of quartz, copper, sulphur, &c.; the shaft will take the north part of the lode in about 2 fms. further sinking. The 35, east of Wilson's shaft, shows a strong lode, with good branches of lead ore intermixed with quartz, blende, and copper for the full width of the drivage; present value 10*l.* per fathom, but ground hard and wet. The stope in the roof of the 35 is worth about 12*l.* per fm., but likely to improve very soon. The winze below the 25, west of junction, is producing about 15 cwts. of lead ore per fathom; water increasing, which prevents good progress. The stopes at the 25 are producing stuff of the usual quality for lead ore. The deposit of ore east of winze below the shallow adit, is producing 15 cwts. of lead ore per fathom; in easy ground for working. It is difficult with the stormy and at times severely cold weather prevailing to keep on dressing regularly, but we have several tons of lead ore ready, and if we have moderately favourable weather I hope to sample 20 tons on the 16th instant.

D'ERESBY MOUNTAIN.—W. Bennets, March 7: We have cleared the intermediate level about 20 fms. After clearing the first 10 fms. we got to a breast of ground standing about 8 ft. high, which the former workers left; they then drove the level above this stope of ground for a considerable distance. I have carefully examined the bottom and the roof of the level; so far as we have cleared the lode for the whole distance is from 2 to 3 ft. wide, and worth in some parts 2 tons of blende and 5 cwts. of lead per fathom, which will pay well for taking away. I would advise you to erect a water-wheel and crusher as soon as possible, when we could make regular returns. In conclusion, I beg to say I have found the mine much better than I expected.

D'ERESBY MOUNTAIN.—W. Benuetts, March 8: I omitted to state in my report of yesterday that our estimated quantity of blende broken is 20 tons. We have to-day blasted two holes in the lode, which is worth 10 cwts. of lead and 1 ton of blende per fathom. This is 15 fathoms from where we broke the blende yesterday. I again strongly recommend the erection of a waterwheel and crush hole, as we can put 12 men to stope in good paying ground at once.

DENBIGHSHIRE CONSOLIDATED.—J. Pryor, March 8: The 112 yard level east is much the same as last reported, and we are urging on as fast as we possibly can. The 112 west is also being pushed forward, and is now showing spar with lead ore. Water is issuing in considerable quantities from both the rises in this level, and we have every reason to think it is issuing from the ore at Parry's. We are proceeding with the examination of the workings on the Cooly-tedw lode.

DEVON GREAT CONSOLS.—Jas. Richards, March 9: Wheal Emma—New South Lode: In the 175 east the lode is 3 ft. wide, composed of capel, spar, mundic, and ore, worth 5 tons, or 15*l.* per fathom. In the 175 cross-cut south the lode has been cut into 8 ft., and the south wall is not yet reached, the leader intersected during the last few feet driving being worth 2 tons of ore per fathom. In the 160 east from 4 to 5 ft. of the lode is being carried, which yields 4 tons, or 12*l.* per fathom, with more lode of a similar character standing south. Gorrell's winze is again resumed below the 160 east, in which 4 ft. of the lode is being carried, which for the length of the winze is worth 6 tons, or 24*l.* per fathom. In the 145 east the lode continues 4 ft. wide, worth 2 tons, or 8*l.* per fathom. Cocking's winze, below the 145 east, being now complete to the 160 the men are removed to cut a plat for a new winze below the 145, at a distance of 35 fathoms east of Cocking's winze, which will in all probability open up good profitable ground, and at the same time greatly improve the ventilation of the 160 and 145 fm. levels. In the 130 east, and east of Tregay's cross-cut, the part of the lode at present being carried, from 5 to 6 ft. wide, is worth 6 tons, or 24*l.* per fathom. In the 100 east, and east of Kitto's cross-cut, the lode continues 2 ft. wide, and worth 3 tons, or 10*l.* per fathom. We sampled on Friday, March 2, 820 tons of ore, for sale on March 22.

DUBBY SYKE.—William Tallentire, March 6: We are rising in the vein at the end of old level: the vein improves in appearance as we get up, and also in width, composed of barytes and red mineral; it looks as if it would be a strong vein when we reach the limestone, and as far as seen is favourable for being productive in that rock. The Shooting Box level is without material change, and only wants pushing forward.

EAST CHIVERTON.—R. Southey, March 8: Since the last meeting we have been working our engine very fast, and struggling hard to get the mastery of such an influx of water as I have never before witnessed in the mine; we have, however, at last got down to the 64, and we are now busily engaged disputing our way foot by foot to the 74, which level we hope to have completely drained by the latter end of next week, and commence to drive the end west of the engine shaft on a lode 3 ft. wide, presenting a very promising appearance, and producing good stones of lead ore. We have resumed the driving of the 64 cross cut south in order to prove if a part of the lode has gone off in that direction. The engine and pitwork are bearing the extraordinary strain put on them in a very remarkable manner.

EAST VAN.—W. Williams, March 7: The 40 is driven west from the bottom of winze 6 fms. So far we have met with nothing worth valuing, only a few spots occasionally. The rise in the back of the 25 is up 10 fms. 3 ft. We are having now and then spots of ore, but the stuff now is not worth saving for dressing. The 25 is now 23 fms. 2 ft. west of Tempest shaft. We are breaking nice stones of ore here occasionally, but the end is not rich enough to value for lead. The driving east upon new lode has been extended 2½ fms. We are still having nice prills of ore in this end, but to-day it does not look quite so well. We have crossed through this lode, and find it to be 3 fms. wide, and now the men are starting to drive west upon it. The 50 cross cut north, out of Tempest shaft, is driven 9 fms.

GAWTON COPPER.—G. Rowe, G. Rowe, jun., March 3: The lode in the 132 east is worth 6*l.* per fathom. The lode in the stopes below the 117 is worth 11*l.* per fathom. The lode in the stopes in the back of the 117 is worth 12*l.* per fathom. The ground in the 105 cross cut, going south, is rather stiff for progress, which we are forcing on with all speed to reach the south lodes. The lode in the 105 east is 3 ft. wide, producing mundic, with occasional stones of ore. The ground in the rise going up in the back of the 95 is moderately easy, and good progress is made, which we calculate to communicate with the 82 shortly. The lode in the 82 east is 4 ft. wide, producing very strong mundic, with good stones of ore, which will be suspended for a few days until the ventilation is restored, and the men placed to resume the drivage of the cross-cut going towards the south lodes. The tribute department is without change. Our last samplings ore weighed off yesterday 164 tons 9 cwts.

GLASGOW CARADON CONSOLS.—Wm. Taylor, Wm. J. Taylor, March 5: New Shaft: The drawing lift is fixed in bottom of this shaft to connect the rods from the engine, all of which we hope to get to work to-morrow, when the sinking will go on below the 78 by nine men as expeditiously as possible. In the 78 east, on the south lode, the part carried is worth 10*l.* per fm, and easy for working. The stope in back of this level, carrying the south part, is worth fully 30*l.* per fathom.—Middle Level: The lode in the end east is disordered for the present, and not of much value, but the ground being still favourable we expect the lode soon to improve. In the winze in bottom of this level the part of the lode carried is worth 18*l.* per fathom, with a good part of the lode to the south. The winze in bottom of this level, on the north lode, is worth 8*l.* per fathom. No change in the 65 fm. level east.—Caunter Lode: In the 52 east the lode is from 2 to 3 ft. wide, chiefly composed of mundic, with good stones of ore. The ground is much easier—this is important, being all in whole ground. Arrol's lode, in the 65 west, is producing stones of ore, but not to value; we expect this will improve as it leaves a small cross-course which has disordered the lode. The stopes and pitches are, on the whole, looking very well, varying in value from 12*l.* to 30*l.* per fathom. The computed quantity of ore for the next sale is 240 tons, which will be sold on March 22.

GLENROY.—R. Rowe, March 9: We have a further improvement in the adit north; the lode is the full width of level; we broke rich stones of ore from it. In the 28 cross-cut to-day we tapped heavy water, and expect we are nearing the lode referred to in the adit. No change in the 40 or 50 stopes or 60 cross-cut. The lodge in bottom of shaft will be finished in a fortnight.

GLYN.—J. Roach, March 5: We have completed the contract in the engine-shaft, and driven a cross cut 9 ft. north on the lode, which is of the most promising discription. I shall let the shaft to sink 5 or 6 fms. deeper, which will give us a depth of 21 fms. under the 28, when I intend to drive east and west on the course of the lode. All indications are in favour of making important discoveries of lead. The 28 west has greatly improved in appearance, and I think it will soon become profitably productive.

GORSEDD AND MERLLYN CONSOLS.—W. Edwards, March 8: I am pleased to report that both our sumps are looking exceedingly well, the ore being of splendid quality and still improving. I am almost convinced that the shaft is not sinking in our great lode, as hinted at in last report, so that our prospects are very great indeed. We sold 50 tons of lead ore to-day, which realised the highest price at the ticketing—5*l.* 16*s.* 6*d.* per ton. Dressing operations are continued, and we have now further good piles of stuff at surface.

GREAT DYLIFFE.—Edward Rogers, March 7: There is no alteration worthy of notice in any of the different points of operations during the past week.

GREEN HURTH.—William Vipond, March 5: All the stopes and workings in the mine continue about as last reported.—New Workings: The rise into the new east and west vein is yielding saving ore, and looks likely for improvement when we get into the limestone. In the driving south on the No. 3 vein nothing new has been cut. The new working north is yielding ore to profit; the vein is a great width, and all bouse work.—Surface Work: The lead ore dressing operations are suspended by the frost and snow.

HARWOOD.—William Tallentire, March 7: There is not much alteration in the east end; it is not quite so hard. We have cut through a back or string running north and south, containing about 1 in. of spar, and are pushing forward as fast as possible to cut the north and south vein.

HINGSTON DOWN CONSOLS.—James Richards, March 8: The engine-shaft continues in regular course of sinking below the 160 fm. level by the side of the lode.—Bailey's Shaft: In the 160 west the lode is 4 ft. wide, yielding 3 tons, or 12*l.* per fathom. In the 160, east of Nicholls' winze, driving towards the shaft, the lode continues worth 4 tons, or 15*l.* per fathom. In the 150 west the men are engaged in stripping down a south part of the lode, about 20 fms. west of Cocking's winze. In the stope in the back of the 150 west the lode still yields 6 tons of ore, worth 18*l.* per fathom. In Chynoweth's rise, in the back of the 140 west, the lode is again showing signs of improvement, and is yielding good stones of ore. In the 120 west, on the south part of the lode, the lode is 2 ft. wide, composed of capel, quartz, and mundic, and is producing saving work. In the 110 west, on the south part of the lode, the lode is 2½ ft. wide, worth 4 tons, or 16*l.* per fathom. In the stope in the back of the 110 west there is good lode, yielding fully 10 tons of ore, worth 30*l.* per fathom. The pitches are turning out their usual quantities of ore. We sampled on Friday last 188 tons of ore for sale on the 22nd inst.

HOLMBUSH.—H. Bennett, March 8: We have cleared the 60 on the lead lode, and shall commence to drive south to-morrow. The lode is about 2 ft. wide, composed of spar and sulphur mundic, with spots of lead. I hope to be able to say more about it next week. The 40 end, east of Miller's shaft, is improved; the lode is looking very well. We have commenced to drive the 20, east of Bennett's shaft, on the Flap Jack lode, by four men; it is a very promising lode. All other tut-work and tribute bargains remain without material change since last reported on.

KINGSTON CONSOLS.—J. Chynoweth, March 8: Spare progress has been made in driving south at the 30, the lode being very hard. We have driven south about 4 fms., and in the same class stuff as when we commenced to drive south, composed of spots of lead, blende, sulphur-mundic, and with spots of copper ore, quartz, and capel. I suppose Capt. Hancock will be at the mine on Saturday next, when we shall consult as to driving any further south. Good progress has been made in driving the 18 west; the lode is 3 ft. wide, the ore bearing part being 14 in. wide, worth from 8 to 10 cwts. of blende and 4 cwts. of lead per fathom. All the different stopes in back of the 18 continue their former value for lead and blende. We shall immediately commence dropping the lift and forking the water at the 40. All the lead and blende sold on the 1st inst. is drawn off the mine, and will be put on shipboard as quick as possible. The machinery is looking well, and giving great satisfaction, and the surface work pushing on as fast as possible.

LADYWELL.—A. Waters, March 8: The 32, south of New Britain lode, by six men, at 7*l.* per fathom; the lode is 2 ft. wide, and letting out much water. The winze below the 18, in front of the above end, by four men, at 2*l.* 15*s.* per fathom; lode 3 ft. wide, and orey. The adit south by four men, at 2*l.* per fathom; lode 2 ft. wide, and worth ½ ton per fathom. The rise in the said level behind the end by two men, at 12*s.* per fathom: lode worth 6 cwts. of lead ore per fathom. Five men tributing in adit at 6*l.* per ton.

LOVELL (THE).—J. Prisk, E. Kempthorne, March 8: At our setting on Saturday, the 3rd inst., we set the following bargains:—The new shaft to sink below the 20, on south lode, by six men and three boys, at 18*l.* per fathom; lode 5 ft. wide, worth 20*l.* per fathom. The 30 to drive east, on south lode, by six men, at 15*l.* 10*s.* per fathom; lode 7 ft. wide, worth 18*l.* per fathom. The new shaft to sink below surface, in the eastern part of the mine, by four men, at 9*l.* per fathom; the lode in the bottom of the shaft is a little disordered for the present, but in the west end it is regular and well defined, and likely to lead to something good. The lode in the rise in the back of the 30 is 6 ft. wide, worth 10*l.* per fm.; working by four men, at 9*l.* per fathom. Nos. 1, 2, and 3 stopes, to 16 men, at 6*l.* per fathom; lode 10 ft. wide, worth 15*l.* per fathom. We have a large quantity of tin ground open, but the quality in the last month has not been quite as good as usual; but, judging from the appearance of the several points of operation, at our next sampling the produce will be higher. The new shaft sinking below the 20 will be communicated with the 30 in two months or less. This will come down in the centre of our tin ground, and will greatly facilitate the working of the mine.

MARKE VALLEY.—Wm. George, J. Stenlake, March 8: The 50 fm. level is being driven west in a very promising lode yielding fully 3 tons of ore per fathom. The winze sinking below the 20 has fallen off in value, now yielding good stones of ore, but not sufficient to value. In the 10 west the lode has improved, and now worth full 2 tons of ore per fathom. No other change to notice.

MEDLYN MOOR.—J. Prisk, C. Rowe, March 8: Since our last report the lode in the 17 west, on No. 1 south lode, is improved, and is now worth 12*l.* per fathom. This level is now entering the run of tin ground spoken of in our report at the last meeting. The 27 west on this lode is also improved, and is opening excellent tin ground. We are making good progress in the rise in the back of the 27, on No. 2 north lode, and hope to effect a communication in a fortnight, after which we shall increase the returns. All other points are without alteration, and the tin at the stamps is coming on very well.

MELLANEAR.—John Gilbert, March 7: We set the following bargains on Saturday last:—The 30 to drive south on the cross-course, west of the skip shaft, by two men and two boys, at 2*l.* per fathom. We have not yet intersected the lode, but from the distance that we have driven we ought to do so very shortly. The 50 to drive west from the flookan, west of the skip shaft, by four men, at 3*l.* per fathom. The lode in this end has not improved since last report. We have put the men to drive a little further north, believing that the main part of the lode may be standing in that direction. The 67 to drive west of the skip shaft, by six men, at 3*l.* 10*s.* per fathom; the lode is worth 4 tons of ore per fathom. The rise in the back of this level, by two men, at 4*l.* per fathom; the lode is worth 4 tons of ore per fathom. The winze in the bottom of this level, by six men, at 3*l.* 10*s.* per fathom; the lode is worth 4 tons of ore per fathom. We expect to hole this winze to the 78 some time this week. The 78, west of Gundry's shaft, by six men, at 6*l.* per fathom; the lode is worth 3½ tons of ore per fathom. This end is still very wet, which makes it very troublesome for driving. The rise in the back of this level, west of the skip shaft, by four men, at 4*l.* 5*s.* per fathom; the lode is worth 3 tons of ore per fathom. The 86, west of the skip shaft, by six men, at 4*l.* 10*s.* per fathom; the lode is worth 3½ tons of ore per fathom, and is letting out a little more water than it has for some time past. The 70 cross cut to drive south from Gundry's shaft, by six men, at 5*l.* per fathom; and the 60 cross cut to drive south from Gundry's shaft, by six men, at 3*l.* 10*s.* per fathom. We calculate that there is about 6 ft. further to drive each of these cross-cuts to intersect the lode, but we cannot tell exactly, as the lode may underlie a little more in the upper levels than we expect. We find that the water is abating a little. The old engine is now working about 12 strokes per minute, and Gundry's engine 3½ strokes per minute. We hope to begin some time next week to connect the balance bob and plunger lift at Gundry's, and get ready for sinking the shaft.

MONYDD GORDDU.—R. Rowse, March 7: We are carting off the 12 tons of lead, which I hope to forward to the buyers on or before Saturday next. Having had the wheel clear from the crusher for two or three days we have nearly forked the water to the 24, and hope to commence sending the big pumps down to-morrow, and resume the cross-cut through the lode at that level early next week. The stuff from the rise over the 12, on the south lode, is cleared; the lode in this rise did not prove so rich as I expected, in consequence of cross-heads, which moved the lode from its average bearing; the end, however, indicates something better. The men at this point will be employed for a day or two sending down the pumps, &c., when they will return. I have no change in either the 12 east, on the main lode, or the stope to write you.

NEW CONSOLS.—R. Pryor, T. Jenkin, H. Vial, March 7: There has no particular change taken place to notice in the underground department during the past week. Saturday next being our pay and setting day a full report shall be sent you. The building of the two new Brenton chlorodisers will be completed to-morrow, when no time will be lost in completing the connecting flues, &c.

NEW SOUTH MERLLYN.—R. Rowlands, March 8: The rise in the 80 south is looking very satisfactory, and is turning out well. We sold at to-day's ticketing 8 tons of lead ore, realising 13*l.* 10*s.* 0*d.*

NEW TYLLWYD.—J. Paull, March 8: The lode in the 30, west of cross-cut, is 3 ft. wide, containing clay-slate, spar, and impregnated with lead ore, and looking kindly for an early improvement, at present looking much better than last week; set to two men, at 15*s.* per fathom, and pay all cost. The 20, on the south lode, is 3 ft. 6 in. wide, orey throughout; all of which will have to be taken to the dressing-floor, although not rich, yet too good to be thrown over the burrow; at this point I look forward to an improvement also, as there is some nice spar just appearing; set to four men, at 150*s.*, and pay all cost. The 20, on middle lode, is not looking so well as I anticipated; lode about 2 ft. wide, with three branches of spar with spots of ore only, and again underlays north, but going in good orey bearing direction eastward; if we do not get something good here this month I shall suggest to drive direct to bottom of the winze independent of lode. I am inclined to think sometimes that the lode in the winze on the south-west branch is the same as we are driving on in the 20 east on south lode. I will dial it out soon, and prove it; set to four men, at 145*s.*, and pay all cost. The pitch over the adit level, on middle lode, is set again as before—four men, at 10*l.* per ton of clean ore, and looks pretty well. We are now crushing the stuff we had accumulated on the flooring, which came from the 30, and also that what came from the winze, and shall have it clean soon. The tributers having a large pile of stuff ready for crusher, and then the other pair of tributers will be ready to bring out their ore to dress, so that we are now in full force in drawing and dressing, and hope we shall not be long in getting about a parcel of ore for market. I beg here to remark that we cannot do anything to the halvans whilst we are engaged about the tributers' ore, as they have to dress their own ore, and make it marketable; as soon as their ore is ready we shall then be able, as I said before, to crush the halvans day and night, and I hope with good results. We are pushing on all operations, both underground and at surface, with all possible economy and dispatch; we had some little trouble in clearing and getting the machinery on floors for dressing in order, it having been idle for some time, but are all in good trim and going well. The very wet weather has impeded our surface operations a great deal, not having scarcely a dry day a week these last three months. All the machinery in good order, and going well.

NORTH BUSY UNITED.—H. Trevethan, March 7: On Dec. 2 we let the bottom end to drive east, on the north part of the main lode; we have a little tin to commence on. I am happy to say it has been regularly improving for the distance driven, which is over 9 fms.; the best of the lode is to the bottom of the end. I am glad to say we can go 15 fms. deeper for hundred of fathoms in length on the course of this lode without the aid of pumping machinery; the lode in the end at the present time is 2½ ft. wide, and worth about 1 ton of tin per fathom; driving for 4*l.* 10*s.* per fathom. I have not seen such a lode of tin before except in East Lovell. We have about 35 fms. to drive this end to intersect a large caunter lode; we may reasonably expect a continuation of rich ground to that point, and if the end continues as rich as at present we can compete with any tin-producing country. We have driven west at this level 65 fms., the greatest part of the backs standing entire; there are only 30 fms. stoped, and three winzes put down, leaving between this level and the level above about 1200 fms. of ground that will be nearly all taken away at a profit, but we have been waiting for a little better price for tin. We have two men stoping east of No. 3 winze, and about 9 fms. west of the above improvement, where the lode is worth 10*l.* per fathom; the lode at this place is 8 ft. wide; the north part for about 2 ft. produces the copper, the remaining 6 ft. is low quality tinstuff. In the last 29 fms. driven west in the 12 the lode will average 3 ft. wide, worth for tin 8*l.* per fathom; driving at 1*l.* 12*s.* 6*d.* per fathom; at this point there is over 200 tons of ground opened, which will come away at a good profit. I may say that the greatest part of the last four months have been spent in laying open reserves, which can be taken away in the summer months at a great advantage.

NORTH LAXEY.—John Sowden, March 6: The shaftmen are making fair progress in sinking. There is a very strong lode, 2 ft. wide, coming into the shaft from the south end, being loose and open, with lumps of lead in the loose spar. The lode in the 121 winze is worth 15 cwts. of lead per fathom, and opening out good stopes north and south of the winze. The 50 rise is rather poor at present; now worth 10 cwts. of lead per fathom.—South Ground: The stope in the sole of the 60 is worth 12 cwts. of lead per fathom. The men in the roof of the 60 are clearing the stuff and taking down ground standing between the two lodes preparatory to driving the 50 end on the west lode, which is standing whole going south, and worth 1 ton of lead per fathom. The 50 stope is worth 1 ton of lead per fathom. The 40 end on the west lode is opening out good stoping ground; now worth 15 cwts. of lead per fathom. The very stormy weather that we have had for the last two months has been very much against surface operations, but it is more favourable now, and we are pushing on as fast as possible, and expect to sample another parcel of lead shortly.

OLD TREBURGETT.—W. Hancock, W. T. Bryant, March 7: No. 3 stope, in the back of the 80, is worth 6*l.* per fathom. The tribute pitch in the back of the 90 has very much improved; also another in the back of the 50, under Massey's shaft, and on the west part of the lode. Other places are much the same as when last reported on. We sampled to-day two parcels of ore—No. 1, computed 25 tons; No. 2, 5 tons, for sale March 15.

PANDORA.—H. Nottingham, March 6: New Lode: The 33, driving south from Pynes shaft, is producing a little lead and blende, but not enough to value yet. No change in the 33 cross cut driving east, to cut Goddard's lode; ground fair for progress. We have this week resumed the driving of this level south; the lode is wide and orey throughout. The old stope, south of rise, is worth ½ ton of lead, and some of blende, to a fathom. No. 2 stope, going south, stripping side and roof of level on No. 2 run of ore, is worth 1 ton of lead and same of blende per fathom; lode about 6 ft. wide. The 23 end, going south, is unproductive, and is for the present suspended, and the men put to extend a cross cut east from the 13 on the cross-course. We shall resume the driving of the end as soon as the stuff can be cleared out. The stope going north from No. 3 winze is not looking so well; worth 15 cwts. of lead and ½ ton blende per fathom. The 13 end is without change; the stope going north of No. 4 winze, under sole of level, has improved; worth for lead 15 cwts. per fathom, and same of blende. The sinking of No. 5 shaft below the 6 has been resumed by four men; the lode here is split into several branches, and unproductive. The stope working between this and No. 4 shaft is without change.—Surface: The weather, which has been more settled the last few days, enables us to make better progress on dressing-floors again; but we are not yet able to get through the work as fast as we should. The reservoirs are all full and running over. Machinery is all in good order.

PARYS MOUNTAIN.—F. Mitchell, March 8: The ground in the 90 south consists of hard elvert, mixed with small strings of sulphur and copper ore, and is rather hard and spare for driving at present. All other points without any change worthy of notice. One of our boilers at the opencast engine requiring some repairs we have taken it out for that purpose, and it will be put in good order again in two or three days.

PATELEY BRIDGE.—C. Williams, March 8: In driving the 30 east on Rake vein we have been continually breaking fine stones of solid lead ore, combined with very congenial matrix, and last night the vein further improved; now showing strings and patches of ore for 2 ft. in width, and the indications are at present strongly in favour of our nearing something of importance. The 30 west on the same vein is still producing some lead ore, and the limestone on the footwall is very much broken, which induces me to believe that we are close upon the bed of ore; the vein at this point is from 8 to 10 ft. wide, and of a very congenial character. The south cross cut in the 20 west to cut Lamb vein is without any material change; ground hard, and spare for driving—showing strings of spar spotted with ore, and letting out a strong feeder of water. The metal pitch on the new vein behind the forebreast of this cross cut has much improved during the last few days, the vein opening out both in the roof and west end; a profitable course of ore, being from 7 to 8 ft. wide, and producing 1 ton of ore per fathom. I have every confidence that we shall lay open a fine run of ore ground in this vein at once. Fielding's vein in the 20 over the north-west drivage is 2 ft. wide, and worth 15*l.* per fathom for lead ore. The metal pitch in the top part of the bed in the 20 is producing 25 cwts. of lead ore per fathom—this point is improving. The Sun vein going east from the bottom of the new shaft under Gilfield's level is 6 ft. wide, composed of limespar, barytes, and rich ore, and producing of the latter 1 ton per fathom.

PEDN-AN DREA.—W. Prideaux, J. Pope, March 8: The various points of operation are giving generally increased yield, and promising further increase. We sold on Saturday, March 3, at Carvedras, one week's produce—9 tons 4 cwts. 0 qr. 27 lbs. of black tin, at 43*l.* 10*s.* per ton, worth 400*l.* 14*s.* 6*d.*

PENNANT BARYTES.—March 8: All our bargains are looking very well, and in the back of the 60 rocks of lead—some weighing over 1 cwt.—are being taken out, and our prospects altogether here appear to be excellent. We sold at to-day's ticketing 20 tons of lead ore, realising 13*l.* 12*s.* 6*d.* per ton. Dressing operations are proceeding satisfactorily.

PENNERLEY.—W. T. Harris, J. Delbridge, March 7: There is no particular change in the prospects of the mine since our last, other than in the winze sinking below the 120, where there is a good lode, but the water has again returned, and is very troublesome. We have placed some men to rise against this winze in the back of the 130, and hope in a few days to let it down. Will report fully on this next week. Surface operations going on as usual.

PLYNLIMMON.—J. Garland, March 8: In Jones's winze, sinking below the 24, the ground continues hard; this winze is now down about 1 fm. 2 ft. Herbert's winze, below this level, is down 5 ft.; the ground is moderately easy for sinking. The stopes over this level, two in number, are without any change since last week. Fair progress is being made towards the completion of new work. Owing to some repairs required in our drawing shaft no stuff has been drawn for the last three days. Hauling has been resumed to-day. Dressing is being pushed on as fast as the present severe weather permits. A detailed report of all operations shall be forwarded next week.

PRINCE OF WALES.—J. Andrews, J. Pryor, March 7: The lode in the 55 west is 2 ft. wide, yielding a little yellow and black ore, but not enough to value. We continue to make good progress in sinking the winze below the 55. The lode in the 45 west is 3 ft. wide, worth 6*l.* per fathom.

— March 8: I am glad to say the water is again drained to the 77, so that we have been in under where the winze is coming down from the 55, and we hear them working very plain. We have have, therefore, taken the men from the 45 end, and put them to rise against the winze.

RELISTIAN CONSOLS.—J. Curtis, March 7: I am glad to report that both the tribute pitches in the 10 are looking better. We are getting on very well with our

next parcel of tin, and shall sell it in the early part of next week. I have set the level to drive, and hope soon to open out another pitch equal to the one close to the end.

RELISTIAN CONSOLS.—J. Curtis, March 8: In the 10 east the lode is worth 6l. per fathom for tin, with good stones of yellow copper ore in it, and looking kindly for further improvement. In the tribute department we have 10 men (on tribute varying from 10s. to 15s. in 1l.), and getting good wages. Our sale of tin this month will be more than double the quantity of the last, and, from the present appearance, will further increase.

ROMAN GRAVELS.—A. Waters, March 8: The 106 to drive south of flat rod shaft, by six men, at 16l. per fathom—worth 3 tons per fathom. The 106, north of shaft, by four men, at 16l per fathom; worth 1 ton per fathom. The winze below the 95, north of shaft, by four men, at 14l. per fathom; the lode is worth 2 tons per fathom. No. 1 stope, in back of the 95 north, by four men, at 6l. 5s. per fathom; worth 1½ ton per fathom. No. 2 stope, north of ditto, by two men, at 6l. per fathom; the lode is worth 3 tons per fathom. No. 3 stope, north of ditto, by four men, at 6l. 5s. per fathom; worth 2½ tons per fathom. The new south engine-shaft to sink for fork below the 106, by nine men, at 30l. per fathom; these men are at present engaged in stripping down the hanging side of the shaft, for the purpose of taking down lode to full width previous to starting on underlie. The 95, south of said shaft, by six men, at 17l. per fathom; lode worth 2 tons per fathom, and improving. No. 1 stope in the 95, south of Dorricott's winze, by four men, at 6l. per fathom; lode worth 1½ ton per fathom. The stope in the 95, north of new engine shaft, by four men, at 6l. 10s. per fathom: worth 1 ton per fathom. The 80 end, south of Wilks's winze south of said shaft, by six men, at 16l. per fm.; worth 2 tons per fathom. No. 1 stope in the 80, south of said winze, by four men, at 6l. 15s. per fathom; worth 3 tons per fathom. No 2 stope, south of ditto, by four men, at 6l. 10s. per fathom; lode worth 1¼ ton per fathom. No. 1 stope in the 80, north of winze, by four men, at 6l. 10s. per fathom; worth 3½ tons per fathom. No. 2 stope, north of ditto, by four men, at 6l. 10s. per fathom; worth 2½ tons per fathom. No. 1 stope in the 80, south of Bishop's winze, by four men, at 6l. per fathom; worth 2½ tons per fathom. No. 2 stope, south of ditto, by four men, at 6l. per fathom; worth 4 tons per fathom. No. 3 stope, south of ditto, by four men, at 6l. 5s. per fathom; worth 2 tons per fathom. No. 4 stope, south of ditto, by four men, at 6l. 5s. per fathom; worth 2 tons per fathom. The 65 end south footwall, part of Roman vein, by four men, at 13l. per fathom; worth 2 tons per fathom. The 65, south of hanging wall portion, by two men, at 7l. 10s. per fathom; worth 2½ tons per fathom. The new winze below the 65, south of Stokes', by six men, at 13l. per fathom; present depth 9 ft., but not yet into the lode. No. 1 stope in the 65, south of Stokes's, by two men, at 4l. 10s. per fathom; worth 1½ ton per fm. No. 2 stope, south of ditto, by four men, at 6l. 5s. per fm. worth 4 tons per fathom. No. 3, by six men, at 6l. per fathom; worth 3 tons per fathom. No. 4, by six men, at 6l. per fathom; worth 3tons per fathom. No. 5, by four men, at 7l. per fathom; worth 3½ tons per fathom. The middle level, below the 65, north of Powell's winze, by four men, at 15l. per fathom; worth 2 tons per fathom. Stope in the roof of said level, by two men, at 6l. per fathom; lode worth 2 tons per fathom. Middle level, below the 65, south of Glover's winze, on east lode, by four men, at 11l. per fathom; worth 2 tons per fathom. No. 1 stope in said level, south of winze, by four men, at 6l. per fathom; worth 1¼ ton per fathom. No. 2 stope, south ditto, by four men, at 6l. per fathom; worth 2 tons per fathom. The 50 end to drive south of Stokes' winze, south of new shaft, by two men, at 10l. per fathom; lode 2ft. wide, with stones of ore. We sent out samples of 220 tons of lead ore to day, for sale next week.

ROOKHOPE.—J. Blenkiron, March 7: I was at the above mines last Friday, our pay-day. There is no change of importance in the general appearance since I last reported you—ore workings all about the same. The Gin shaft is holed and secured to the 25, and guides for cages are being fixed between the 15 and 25 fm. levels. We shall be ready for drawing stuff as soon as house team or kiln is ready to receive the same. I am sorry to say that the weather keeps very unfavourable for out-door work. This morning we have a heavy fall of snow, and ore dressing is stopped here (Yorkshire). I am afraid it will not be any better in Weardale. I put three men to cut out for dam or reservoir for high floors, purposing to let a contract for the same on my next visit. I tried to contract for it, but no party would undertake it as the weather is, except at an exorbitant price. I have a note to-day from Brown stating that all is progressing favourably inside the mine and on low floors, but no carting can be done to high floors.

SAINT PATRICK.—W. Francis, March 7: The 120 yard cross-cut north progresses as favourably as ever, with the cross-course still as wide, and containing fine mineral compounds. I am expecting to cut the next vein during the present month. The 60 yard cross-cut, in the chert, is also looking very promising. We drove 6 fms. here during the past month.

SOUTH CONDURROW.—Wm. Rich, W. Williams, Henry Abraham, March 7: We have eased and divided the Plantation shaft from the shallow adit to the 10; the men are now engaged in cutting plat at the bottom of the shaft. The cross cut north of the engine shaft has not yet reached the lode, but the ground is getting softer for driving. The 50 east is worth 12l. per fathom. The rise in the back of this level is worth 10l. per fathom. The 50 ends, east and west of the cross-cut, are each worth 12l. per fathom. The 60 west is worth 12l. per fathom. The rise in the back of the 60 is worth 10l. per fathom. The sink in the bottom of the 60 is worth 15l. per fathom. The 70 west is worth 8l. per fathom. The rise in the back of the 70 is worth 12l. per fathom. The winze in the bottom of the 80 west is worth 9l. per fathom. The 82 end east is worth 10l. per fathom.

SOUTH DARREN.—Henry James, Arthur Gundry, March 6: Setting Report: We only set one bargain in the back of the 90 to stope, by six men, at 70s. per fathom; value 8l. per fathom. Owing to the water being in at the aforesaid level we are unable to commence driving it, but hope to do so in a day or two. We have all the castings for the drawing machine fixed, and it is completed with the exception of some little fittings. The carpenter is busily engaged finishing the fixing of the work at the shaft head, pully stands, &c., and if the weather is favourable those will soon be completed. We had some of the castings from the foudry for the crushing mill yesterday. A carpenter and the fitter are engaged fixing them, and if they are not delayed by waiting for other castings the crusher will soon be finished. Every effort is being made to push on the different erections as fast as possible. We have had nothing but rain every day for a long time, which has been very much against the speed of our new erections. The weather this week appears to be more favourable, and we hope to be able to make good progress.

SOUTH TOLCARNE.—William Rich, William Hambly, March 6: The gossan lode in the adit end east is improving, and is now yielding fine stones of rich copper ore. The 50 east on Fraser's yields a little copper. The lode is large, and has a kindly appearance. We are making good progress in driving east on the course of the lode; six men extended the level 9 fms. 2 ft. during the past four weeks. We have set men to costean in search of the South Condurrow lodes near the western boundary of that mine.

TALYBONT.—Thomas Glanville, March 5: The only alteration to report since writing to you last is that in driving the upper level on the north and south lode we have met with a very large cast and west lode, disseminated throughout with lead ore, which I believe will lead to good results.

TANKERVILLE.—A. Waters, March 8: Setting Report: Watson's engine shaft, below the 180, ay nine men, at 25l. per fathom; present depth 6 fms. The 180, west of shaft, by six men, at 14l. per fathom; lode worth 6 tons per fathom. The 180, east of shaft, by six men, at 15l. per fathom; lode worth 5 tons per fathom. No. 1 stope in back of the 180, east of No. 1 winze, by six men, at 7l. per fathom; lode worth 3½ tons per fathom. No. 2 stope, west of ditto, by six men, at 7l. per fathom; lode also worth 3½ tons fathom. The stope in the 180, west of No. 2 winze, by four men, at 7l. per fathom; lode worth 2½ tons per fathom. No. 1 clope, in bottom of the 167, east of No. 1 winze, by five men, at 7l. per fathom; lode worth 4 tons per fathom. The stope in same level, west of winze, by four men, at 7l. per fathom; lode worth 2½ tons per fathom. The stope east of said winze, by six men, at 7l. per fathom; lode worth 2½ tons per fathom. The stope in the 167, west of No. 2 winze, by six men, at 7l. per fathom; worth 3½ tons per fathom. The 167, to drive east of shaft, by six men, at 14l. per fathom; lode 4 ft. wide, yielding good stones of ore. The 152 cross cut to drive north of Tankerville lode, towards north lodes, by four men, at 12l. per fathom. The 142 cross cut to drive south of Tankerville lode, towards side lodes, by two men, at 12l. per fathom. The stope in the 130, west of shaft, by four men, at 7l. per fathom; worth 2 tons per fathom. No. 2 tope, in the same level west, by four men, at 7l. per fathom; lode worth 1½ ton per fathom. The 120 to drive west, on south lode, by four men, at 11l. per fathom; a kindly lode. The 120 to drive west of Madox cross-cut, on middle north lode, by four men, at 12l. per fathom; lode of a promising character. The 92 cross-cut to drive north of Tankerville lode, towards old mine, by four men, at 12l. per fathom. The stope in the 82, east of shaft, by four men, at 6l. 10s.; worth 1½ ton per fathom. The stope in the 74, west of shaft, by four men, at 7l. per fathom; lode worth 1 ton per fathom. We have to-day sampled 100 tons for sale on Thursday next.

TEESDALE.—T. Watson, March 2: We have stoped the whole of the vein down to water level and close up to the Cow Rake or east and west vein, and have had good ore close up to the cheek or wall of this vein; four men will now have a bargain to cut through this vein at the level sole, and into whole ground in the north and south vein. The east and west vein has been productive eastward so far as the old miners could get down from surface for water; west it is untried, and we shall thus have three new places to work in whole ground. I expect the north and south vein will be thrown a fathom or two to the east. No change of importance in any other workings. The frost and snow have put a stop to all lead ore dressing operations and surface work.

TREBEIGH CONSOLS.—J. Gifford, March 8: The sinking of the engine-shaft is progressing favourably. The branch or lode is still keeping its regular course, and producing a little of both silver lead and blende ores; although not in paying quantities it is looking very promising in the bottom of the shaft. We hope to get the shaft down to a 30 fm. level and commence cross cutting north towards the east and west lode before the general meeting.

TRELEIGH WOOD.—Edwin Hosking, William Goldsworthy, March 8: The lode in the 56, west of the engine-shaft, is looking more promising, and yielding fair quality tinstuff. There is no change in the 44 east. The 24, east of the cross-course, is worth for the part carrying (8 ft.) 8l. per fathom. The tribute pitches are looking very well, and yielding good quality tinstuff. We are busy about the dressing, and intend selling a parcel of tin on Wednesday next. We will send you a setting report on Saturday next.

TRESELLYN (Tin).—J. Hodges, March 7: I am pleased to say the lode in the 20 west has improved. It is worth 16l. per fathom for tin, and likely to further improve. All our machinery is in good order.

VAN CONSOLS.—James Roach, March 5: I have let all the pitwork to fix in Murray's shaft from surface to the 40 under deep adit, including ladder ways, &c., also the shaft to sink to a 50 under adit, including timbering, dividing, casing, and all other work connected therewith, as well as the drainage of water during the performance of the contract, for the sum of 170l. As soon as the pitwork is completed sinking will be resumed in a fine lode of lead. In the 40, west of Murray's, we are cross-cutting the lode, which has exposed lead for 10 ft. in width, and apparently more ore yet standing south. The stope in the winze above is producing lead just as expected. The 40, east of Gundry's, is without alteration since my last advice.

WEST CHIVERTON.—R. Southey, Wm. Roberts, James Moyle, March 8: Setting Report: The 160 to drive west of Batters' shaft, by six men, the month, at 9l. per fm.; the lode is worth 15l. per fathom for lead. The 160 to drive east of Batters' shaft, by four men, the month, at 7l. per fathom; the the lode is worth 10l. per fathom. A winze to sink below the 150, west of Batters' shaft, by six men, at 8l. 10s. per fm.; the lode is worth 12l. per fm. The 150 to drive east of Batters' shaft, by four men, the month, at 8l. 10s. per fathom; the lode is producing good stones of lead ore. The 150 to drive east of cross cut, on the north lode, by four men, the month, at 8l. 10s. per fathom; the lode is worth for lead and blende 10l. per fathom. Glubb's shaft to sink below the 140, by nine men and three boys, the month, or hole, at 15l. per fathom. The 140 to drive east of Hawkes' shaft, by six men, the month, at 6l. 10s. per fm.; the lode is worth for lead 15l. per fathom. A winze to sink below the 130, by six men, at 7l. per fm. for the month; the lode is producing good stones of lead ore. The 120 to drive west of Burgess' shaft, by four men, the month, at 7l. per fm.; the lode is worth for lead and blende 20l. per fathom. Other parts of the mine are opening out to our satisfaction. Our breakage in the winding department of Hawkes' shaft is again put right, and working smoothly, as usual.

WEST GODOLPHIN.—J. Pope, March 2: Wilson's: In driving the 50 west, by two men, at 4l. per fathom; lode 2 ft. wide, worth 3l. per fathom—producing tin. To sink the winze in the 50 west, by six men, at 5l. 10s. per fathom; lode 3 ft. wide, worth 10l. per fathom—producing tin. To stope in bottom of the 50 west, by six men, at 5l. per fathom; lode 7 ft. wide, worth 20l. per fathom—producing tin and copper. To stope in bottom of the 50 west, by six men, at 5l. per fathom; lode 10 ft. wide, worth 20l. per fathom—producing tin and copper. To stope in bottom of the 50 west, by six men, at 5l. per fathom; lode 10 ft. wide, worth 20l per fathom—producing tin and copper. To stope in back of the 50 west, by two men and two boys, at 3l. per fathom; lode 4 ft. 6 in wide, worth 8l. per fathom—producing tin. To stope in back of the 50 west, by four men, at 1l. 15s. per fathom; lode 2 ft. 6 in. wide, worth 4l. per fathom—producing tin. To stope in back of the 50 west, by three men and three boys, at 2l. 5s. per fathom; lode 3 ft. wide, worth 5l. per fathom—producing tin. To drive the 50 east, by two men, at 6l. per fathom; lode 2 ft. 6 in. wide, worth 8l. per fathom—producing tin and copper. To stope the bottom of the 50 east, by six men, at 6l. per fathom; lode 7 ft. wide, worth 20l. per fathom—producing tin and copper. To stope the bottom of the 50 east, by nine men, at 9l. per fathom; lode 12l. wide, worth 30l. per fm. —producing tin and copper. To stope in back of the 50 east, by four men, at 2l. per fathom; lode 3 ft. wide, worth 6l. per fathom—producing tin. To sink Boulton's shaft below the 50, by six men, at 9l. per fathom; per bargain to cut a barrow-road by the side of the shaft, preparatory to sinking below the 50. We have 12 men stripping the sides and stoping the bottom of the 50 west, near the caunter, and two men stripping the stdes of the 50, east of Boulton's shaft. I cannot set to these men as I do not know how wide we shall have to go. To driving the 40 west, by two men, at 4l. per fathom; lode small. To stope the bottom of 40 east, by six men, at 3l. per fathom; lode 4 ft. wide, worth 8l. per fathom—producing tin and copper. To stope in back of the 40 east, by four men, at 2l. per fathom; lode 3 ft. wide, worth 6l. per fathom—producing tin and copper. The deep adit driving west, by two men, at 3l. per fathom; lode 2 ft. wide, producing low-price tinstuff. Pressure shaftmen when not attending the water in Pressure shaft are engaged cutting ground in Boulton's shaft, at the bottom of the perpendicular, for a sett of rolls. Our machinery is all working well, and forking the water at a fair rate. Our stopes in the bottom of ths 50 are all dry, but we cannot work these stopes to so good advantage as when the water was out of the 60, as the men have to draw all the stuff to the 50 with a windlass.

WEST GOGINAN.—John Kitto, Feb. 23: We have resumed the sinking of the engine-shaft below the 36, and will have it pushed on as rapidly as possible, until it reaches the 48, where I purpose again cross cutting the lode. There is nothing new to refer to in the 36 west, but we have commenced to sink a winze below the 24, some fathoms in advance of the 36 end, where we have some good ore, and I have little or no doubt that this will further improve in going down. I have no other change to report to you. All our operations are progressing regularly, and fair progress is being made in the development of the mine underground, but we are doing nothing at surface more than is absolutely necessary.

WEST TANKERVILLE.—A. Waters, March 8: The 75, south of boundary shaft, by six men, at 13l. 10s. per fathom; lode worth 12 cwts. per fathom. The stope in the back of the 75 south, by two men, at 5l. 10s. per fathom; lode worth 1 ton per fathom. The winze below the 63, by nine men, at 20l. per fathom; lode worth 1 ton per fathom. The 63 to drive south of shaft, by two men, at 9l. per fathom, worth 12 cwts. per fathom. The stope in the back of the 63 south, by four men, at 4l. per fathom; lode worth 1 ton per fathom. No. 2 stope, by six men, at 5l. 10s. per fathom, worth 2 tons per fathom. No. 3 stope, by four men, at 4l. per fathom; lode worth 1½ ton per fathom. No. 1 stope, in the 50 south, by two men, at 4l. 10s. per fathom, worth 1½ ton per fathom. No. 2 stope, by four men, at 3l. 10s. per fathom; lode worth 1 ton per fathom. The stope in the 50, north of shaft, by two men, at 4l. per fathom; lode worth 12l. per fathom. We have to-day sold 35 tons of lead and 20 tons of blende, realising 592l. 2s. 6d.

WEST TRESAVEAN.—G. Stephens, March 8: I am not able to add more respecting the copper lode intersected in the north cross-cut than reported to you last week. The air is bad, and will not allow us to work yet, but I hope to send in air in a few days. There is fine grey and black copper ore in this lode; and, in my opinion, a great discovery will be made here. I am quite ready to drop the lift in Gobbin's shaft; this shaft is well secured with timber, and we have put in the ladders, &c., complete. We are now also ready to put back the boiler in its place, and have cleaned up the engine and put in new windows to engine-house. I am pushing on with all possible dispatch.

WEST WHEAL TOLGUS.—March 7: In Taylor's shaft the ground is rather stiff, but unkindly for the production of copper ore. The shaft is being sunk on the back of the lode, but close to it, and we have very little doubt of its being a good one. The 135 is being driven in a lode which is 2 ft. wide—a kindly one, but not very orey. The lode in the 135 end west is 8 ft. wide, and will yield 12 tons of ore per fathom. The stope in the back and side of the 135, west of No. 2 winze, will yield 12 tons of good ore per fathom. This stope is set to be carried 12 ft. high from the bottom of the level at per cubic fathom; the full width of the lode is from 8 to 9 ft. The lode in the stope, east of No. 1 winze, will yield 4 tons of ore per fathom. The lode in No. 4 winze, in the bottom of the 125 west of shaft, will yield 5 tons of ore per fathom. This winze is 8 fms. west of No. 3 winze and 7½ fms. west of the 135 end. The 125 end west has been suspended for want of air, and the men are put to rise some 4 or 5 fms. out from the end on the lode, which will yield 3 tons of ore per fathom. The end will also yield 3 tons of ore per fathom. The men are all regularly at work, and the water easily kept out of the mine. We have estimated 240 tons of good ore for the present month. It is a large quantity from the bottom level though with a few men. The 135, with what we have driven through and the sides that are now being taken down, will yield great quantities of ore. In Richards's shaft the lode is large, but not much ore in it. In order to get deep enough for a trip plat for the 95 we have decided on sinking 3 or 4 ft. more. The water having lessened so much we will soon effect a great saving in coals.

WHEAL AGAR.—E. Moyle, March 7: The shaft below the 195 is being sunk, by 18 men, and the north part of the lode being stoped. The lode continues as rich as last reported. No north wall has yet been seen. The ground north of the plat has been driven and stoped 23 ft. from the south side of the plat, and no wall has yet been seen. The tinstuff broken here is about one-third the produce of the shaft, still it assays 60 lbs. to the ton of stuff. We sold 120 tons of tinstuff last Monday for 214l. We hope to sell again next week. The lode is large and rich, and as soon as yur burning-house and floors are completed the result of our working will be satisfactory to the shareholders.

WHEAL CREBOR.—J. Andrews, March 6: The lode in the 120 east is 6 feet wide, worth 15l. per fathom. The lode in the 108 east is 5 ft. wide, worth 12l. per fathom. The lode in the stopes in back of the 108 is 4½ ft. wide, worth 20l. per fathom. We continue to make good progress in sinking the winze by the side of the lode below the 108, which is now down nearly 8 fms. below the level. There is no change in the 72 east. In the 48 east the lode has a better appearance, and yields good stones of copper ore. The lode in the stope in the bottom of the 48 is 4 ft. wide, worth 15l. per fathom.

WHEAL GRENVILLE.—T. Hodge, March 7: Western Shaft: The 150 is drained, and the east end resumed by a full pare of men, the lode in which is worth 9l. per fathom. The 150 east stope is worth 7l. per fathom. The 150 west stope is worth 6l. per fathom. The stope in the back of the 140 east is worth 6l. per fathom. The stope in the bottom of the 130 is worth 9l. per fathom. The stope in the back of the 130 east is worth 10l. per fathom. The stope in the back of the 130, east of Davis's, is worth 7l. per fathom. The 130 east end is yielding stamping work: this end is likely to improve as we advance. We shall connect the flat rods at the north shaft this afternoon to give it a 12 hours trial, and if we succeed in forking we shall continue on, but, on the other hand, if we find that we cannot make any progress we shall disengage the rods again. We have a pare of men repairing the north shaft. We shall have to put in several new sets of timber near the surface. The men clearing out foundations for the engine house, &c., are going on with fair speed. All surface work is being pushed on vigorously, and if we have any speed in forking our deeper levels that are now under water, we shall be in the market again with regular sales of tin.

— T. Hodge, March 8: The 150 east end is looking very encouraging, gradually improving as we go forward. The 130 east end is producing stamping work. I see no change in the stopes worthy of any notice. The water is very busy, and our forking is slow; now about 3ft. below the 150. We have a pare of men timbering the north shaft, and also a pare taking out foundation buildings. All our heads are at work, but I do not think we shall be able to keep them going all the time until we have drained another level.

WHEAL KITTY (St. Agnes).—S. Davey, R. Harris, March 3: We have no change to remark in either of the bargains throughout the mine except the 65 fm. level west, where the lode has improved, now 3 feet wide, and worth for tin 11l. per fathom.

WHEAL NEWTON.—H. Bennett, March 8: We have been cutting plat at the 40, at Cook's shaft, during the past week. We shall now commence to drive east and west, on the silver lode and stope, the back of the eastern level, where the lode is looking well. All our other bargains are much the same as when last reported on. Next Saturday being our setting, a full report shall follow.

WHEAL PEEVOR.—W. S. White, J. Pryor, March 7: We stopped our pumping-engine on Jan. 5 last in consequence of the great influx of water referred to in our report at the last meeting; the water rose rapidly, and the mine was soon full to the adit. During the past six weeks the water has considerably abated in the County Adit, and on the 14th ult. we again put our engine to work, and on the 5th inst. we were in fork at the bottom or 70 fm. level, having drained the mine without a single let or hinderance from the adit level in 19 days, being one of, if not, the speediest forking of a mine of water in the county. All our underground operations are now in full course of working, and are looking just the same as last reported. Engine and pitwork still working very satisfactorily.

WHEAL PRUSSIA.—Wm. Tregay, March 8: The water is not yet quite out of the bottom so as to enable us to sink. The lode in the 30 east is worth 20l. per fathom. In the 30 west we have just struck into a rich leader of tin, but have not yet seen sufficient of it to ascertain its value.

WHEAL UNY.—W. Rich, Mathew Rogers, W. Bennetts, March 3: The lode in the 160 end west carries good stones of tin, and is improving. We are sinking Hind's shaft below the 160. The lode is worth 20l per fathom. The rise in the back of the 150 east yields low quality tin stone. The 140 east is worth 12l. per fathom. The 130 east is worth 10l. per fathom. The rise in the 60 west is worth 8l. per fathom.

WHEAL UNITY WOOD.—G. E. Tremayne, Wm. Mayne, March 7: Major's Engine Shaft: The plat in the 80 is completed, solar, &c., fixed, and the men are at present engaged cutting ground for the penthouse and tramroad preparatory to sinking below this level. In the 80, west of the shaft, the lode has improved; it is now 5 ft. wide, and worth for tin 30l. per fathom. East in this level the lode has also improved, being 6 ft. wide, and worth for tin and copper fully 20l. per fathom, with a most kindly appearance for further improvement. In the rise in the back of the level, west of the shaft, the lode is at present disordered by a small cross-course. In the 70, east of shaft, the lode has fallen off in value for copper, but still continues to produce good work for tin. West in this level the lode still continues poor, although the appearances are such that an improvement may soon be expected. All other places are without any material alteration since the meeting, held Feb. 22.

WHITE CLIFF.—John Jones, March 8: I have nothing fresh to report on the Alltwen workings, the ground in the stope and the sinking continuing to look just the same.—Gorlan: I am glad to say there is a great improvement in the stope to the west of the engine-shaft; the lode is from 4 to 5 ft. wide, and is composed of lead, traces of carbonate of lead and carbonate of lime. It is fully worth 4 tons of lead ore to the fathom, and in order to get as good a hold on this ground as possible, I intend putting four men, on Monday to continue the sinking of the shaft for another 10 yards, after which I have every confidence that this end of the mine will realise the highest expectations formed of it. The lead ore sampled last week has been bought by Mr. Eyton, at 14l. 10s. per ton, but owing to the severity of the weather, and being without the crusher for five weeks, owing to its having broken twice, we have not been able to get 10 tons ready; but I am looking anxiously forward to the time when we shall have new dressing machinery to replace the present ones, so that our work in this branch will be carried on much quicker.

THE VAN MINES—MONTHLY REPORT.

March 7.—The 105 fm. levels, east and west of shaft, have not been taken, but I shall probably be able to set them in the course of a day or two. The 90, west of shaft, is set to six men, to drive along the course of the lode, at 240s. per fathom; the lode for the width carried is worth 35l. per cubic fathom for lead ore. From what we saw going down in the bottom of the 75 we may expect good ore ground at this level for the next 70 fms. At a point 40 fms. west of shaft, in the side of this level, we have set to six men, to strip down the lode to full width, at 1 0s. per fathom, worth for lead ore 35l. per cubic fathom. The same, at a point 30 fms. west of shaft, to twelve men, at 110s. per fathom. The same, at a point 8 fathoms west of shaft, to eight men, at 85s. per fathom. These two points are worth on an average 30l. per cubic fathom. Average width, 6½ fms.

The 90 fm level, east of shaft, is set to four men, at 150s. per fathom; this level is driving upon a strong lode, worth for lead and blende 12l. per cubic fathom. In the 75 fm. level, west of shaft, at the present end we have crossed north 10 feet through a lode worth, so far, 20l. per cubic fathom; set to six men at 220s. per fathom; as soon as we have reached the footwall we shall resume the driving westward. The stopes in the back of this level, west of shaft, are set as under:—The 100 stope to six men, at 80s. per fathom. The 90 stope to eight men, at 70s. per fathom. The 80 stope to six men, at 70s. per fathom. The 70 stope to six men, at 70s. per fathom. The 60 stope to six men, at 70s. per fathom. The 50 stope to eight men, at 70s. per fathom. The 40 stope to eight men, at 70s. per fathom. The 30 stope to eight men, at 70s. per fathom. The 20 stope to eight men, at 65s. per fathom. The average width of these stopes is 19 ft., and average worth of 31l. per cubic fathom.

The stripping of the lode to the full width in the side of the 75, east of shaft, is set to six men, at 10 0s. per fathom, worth for lead ore 30l. per cubic fathom. The 75, east of shaft, is set to four men, at 90s. per fathom; we are carrying a part of the lode with us, which is worth for lead ore 27l. per cubic fathom. This points looks very encouraging. The 60, east of the shaft, is set to four men, at 75s. per fathom, to drive by the side of the lode. The stopes in the back of this level, east and west of shaft, are set as under:—The 40 east, to six men, at 70s. per fathom. The 16 east, to six men, at 65s. per fathom. The 8 east, to eight men, at 65s. per fathom. The 16 west, to eight men, at 65s. per fathom. The 32 west, to eight men, at 70s. per fathom. The 48 west, to eight men, at 6 s. per fathom. The 56 west, to eight men, at 70s. per fathom. The 64 west, to eight men, at 65s. per fathom. The 72, to eight men, at 75s. per fathom. The 90, to eight men, at 65s. per fathom. The 100, to eight men, at 70s. per fathom. The 115, to eight men, at 65s. per fathom. These stopes are worth on the average 22l. 10s. per cubic fm.; mean width 16½ ft.

The 60 fm. permanent level, west of shaft, is set to six men, at 80s. per fathom. The winze sinking below the 60, at a point 140 fms. west of shaft, is set to four men, at 120s. per fathom. A cross-cut to communicate with the 45 fms. permanent level, at a point 65 fms. west of shaft, is set to four men, at 80s. per fathom. The stopes in the back of this level, east and west of shaft, are set as follows:—The 90 west, to eight men, at 75s. per fathom; the 70 west, to eight men, at 80s. per fathom; the 60 west, to eight men, at 90s. per fathom; the 8 east, to six men, at 90s. per fathom; the 40 east, to six men, at 95s. per fathom; the 54 east, to eight men, at 95s. These stopes are worth on the average 23l. 10s. per cubic fathom; mean width, 15 ft. 6 in.—Surface: All surface work is progressing satisfactorily, dressing going on regular, and machinery in good order. Our monthly sale takes place to morrow upon 500 tons lead and 200 tons blende.—WM. WILLIAMS.

ECHOES FROM THE MINING MARKET.

The symptoms of revival in mining affairs noticed last week have continued, although at present they are slight, and extend only to two or three departments of the market. Lead and foreign mine shares have been fairly dealt in, and a rather more reassuring view has been taken of the tin market. At present, however, there is no actual change for the better in this metal, prices remaining dull, and extremely depressed. A fair amount of business has been done in colliery shares, but iron shares are quite neglected.

Cornish mines have been chiefly represented by the leading ones, the quotations of many of the lower priced shares being purely nominal. News from "the county" is very light this week, as so little is doing in the local markets, and the different mines present no particular features of interest. A decline has occurred in West Seton, and the quotation is now only 25 to 30. The bottom end in Dolcoath is reported to be looking much better. New Cook's Kitchen shares have been enquired for at 2¾ to 3¼. South Condurrow are 6½ to 6¾. A good amount of business has been done in South Caru Brea, but the price is extremely low, being only 2s. 6d. to 5s.

For Devonshire mines there has been a fair demand. In Bedford United a call of 2s. per share has been made; call paid, the quotation closes 11s. to 13s. Cocking's winze in Devon Consols has been holed to the 140; the lode is worth 30l. per fathom. The 130, east of Tregay's, is worth 12 tons of copper ore, or about 80l. per fathom. The last sale realised 318l. (82 tons of copper ore). Gawton shares are offering very low. The ordinary meeting of the Penstruthal Company will be held on the 16th inst.

A fall has taken place in East Van, and the shares close weak at 7 to 7½. Rookhope are 16s. to 18s.; Van Consols, 2¾ to 3; Glyn, 1⅞ to 2⅛. Lead shares generally are firm, and a better business would soon create a brisk market. It is a very satisfactory feature that although we are passing through an exceptionally dull period for all classes of securities good lead shares maintain their prices well. Roman Gravels, Van, Tankerville, Leadhills, Grogwinion, Great Laxey, Wye Valley, West Chiverton, and others we might name rank as first class properties, and should just now be worth the attention of the careful investor. Of the non-dividend, but improving, mines Rookhope, West Tankerville, North Laxey, and the Van progressive group are most in favour. JAMES H. CROFTS.

THE WEEK.

SATURDAY, MARCH 3.—The half panic among the holders of American railway securities does not seem to have reached its worst yet, most of the leading lines again went down, and closed at the worst. Allegheny touched 9¼, and Central Illinois was done at 85½; at the commencement of the year the former was fetching 100, and the other 90. Central Jersey, now about 86, was then 85. Foreign bonds were a strong market, Russian 1873 advanced ⅜, to 83. Egyptian 1867 rose 2, to 73. In railways North British recovered to par, late "bears" closing their accounts. Looking simply to the dividends paid, the price of the stock seems quite high enough. Van Consols shares were rather in demand at 2 , but East Van was offered at 9¼. Eberhardt, 8½ to 8¾; North Laxey, 16s. to 18s.; Rookhope, ⅞ to 1.

MONDAY.—Home railways were decidedly in demand all thoughout the day, and in some instances rather important rises took place. Thus Dover, A, rose 1¼ to 114¼, Caledonian 1l. to 124½, North British ¾ to 100¾, Midland ½ to 127½, and Sheffield 5⅝ to 73⅝. Great Eastern remained firm at 52, while York, A, went up 10s. to 129⅜. Among foreign bonds Egyptians were the most buoyant. An advance of 1½ took place in Khedive, to 38, while the 1873 issue was ⅝ better, and closed 48 to 4 . The new Unified stock was steady at 36, and the preferred at 78¼. In mining a further recovery of 10l. took place in St. John del Rey, to 285. Van Consols had a good rise, leaving off at 3, buyers. Eberhardt closed 8¾ to 9, and Richmond 6 to 6½. American railways were quoted thus:—Illinois Central, 850 to 851; New York Central, 890 to 892; Philadelphia and Reading, 852 to 854; Atlantic First, 820½ to 821½; ditto Second, 87½ to 88½. Direct Cable, 10⅞ to 11⅛. Globe, 4⅛ to 4¼.

TUESDAY.—Great Eastern and York A gave way rather seriously to-day on a report that the negociations were again "off." From 52 the former ran down rapidly to 51, and from that recovered to 51⅝ by the close. The fall in York A was 10s. North Eastern was bought for investment, and as the stock is rather scarce before the operation could be concluded the stock was 1l. higher (154¼ to 155). In the miscellaneous department Hudson Bay shares were pressed for sale, and gave way 17s. 6d., to 13½. Several other securities here showed heaviness, notably Van Diemen's Land, which declined to 16¼. East Van was dull at 8¾.

WEDNESDAY.—The tendency was again dull for railways all the morning—afterwards there was some recovery. Thus North British, after having been done at 99⅝, recovered to 100¼, and Brighton, A, closed over 107, after being below 104½. Great Eastern, 51⅜ to 51⅝; Dover, A, 114¼ to 114½; Great Western, 104¼ to 105; Midland, 125⅝ to 125⅞. American securities were rather better today. Baltimore, 90 to 92; New York Central, 891 to 893; Illinois Central, 50½ to 51. Direct Cable shares remained unchanged, at 11; Brazilian, 4⅛; West India, 2¾ to 2⅞. Among mines Eberhardt was dealt in at 9; Captain Drake reports—"Incline looking very favourable." Bird-eye Creek has made a profit of $1000; the shares are 1⅝ to 1¾. Business was done in Don Pedro at 10⅜, in Last Chance at 1l. 18s., in Flagstaff at 3½, in Exchequer at 1⅝, and in St. John del Rey at 310 and 295.

THURSDAY.—Great Eastern after falling to 51 recovered rapidly in the afternoon, touching 52, and closing at 51¾. York A showed no movement. There was no other change exceeding ¼. American Railways again attracted purchasers. Central of New Jersey rose 1½, to 55; there was the same advance in Pennsylvania. In mines the chief feature was the depression in East Van, which in the end closed no better than 7⅛—a further fall of 1l. Van Consols were slightly easier. Richmond improved 5s., to 6½.

FRIDAY (*Opening*).—Birmingham Railway has touched 148, and Midland 128, but otherwise there is little or no change from last night. Great Eastern, 51⅜ to 51⅝; Caledonian, 124½ to 124¾; British, 99⅝ to 99⅞; Great Western, 104¼ to 105; Dover, A, 114⅛ to 114⅜. Consols are 96⅛ to 96⅝. Russian, 82¾ to 83; and Egyptian, 47⅞ to 48⅛. The settlement commences on Monday, which, no doubt, in some measure restricts fresh business. Mining shares are firm, without much being done. Eberhardt, 8¾ to 9; Flagstaff, 3⅝ to 3¾; North Laxey, 16s. to 18s.; Rookhope, ⅞ to 1. Chapel House are quoted 3 1-16th to 3⅜. Bilson and Crump, 7 to 7½.—*Two o'Clock.*—Turkish of 1871 are very much depressed, and quite 2¼ down from yesterday, being 27½ to 28. In American railways Central of New Jersey and Philadelphia and Reading are offered, and about 1 lower. Brighton, A, 107½ to 107¾; Brazilian, 1875, 90½ to 91½.—*Four o'Clock.*—North-Eastern are quoted 154⅜ to 154⅝, which is ⅜ lower, while Sheffield are no better than 73¼ to 73⅝—a fall of 12s. 6d. Otherwise there is little change since two o'clock. India Five per Cents. appear to maintain the rise, and tramway shares continue firm. Pennerley, 15s. to 17s.; Exchequer, 1⅛ to 1⅜.

Birchin lane, March 9. FERDINAND R. KIEK.

HALIFAX.—March 8: The following quotations are from Mr. J. H. Thackrah's list:—Halifax and Huddersfield Union Bank, 19¾; Halifax Joint Stock Bank, 30¼; Halifax Commercial Bank, 24½; London and Yorkshire Bank, 25s.; John Crossley's, 97½; Whitworth and Co., 7½; Bradford Brick and Tile, A, 14; ditto B, 5; Ripponden Commercial, 9¼; Yorkshire Boiler Insurance Company, 13½; Norton Brothers, 7; Heckmondwike Manufacturing Company, 31½; Goole Steam Shipping Company, 11.

*** With this week's Journal a SUPPLEMENTAL SHEET is given, which contains—Original Correspondence: Our Commerce in Metals; Nova Scotia Gold Field; the New Silver Mines in Colorado (J. L. Stuart); News from New Mexico—No. IV. (F. M. F. Cazin); Outlines of Geology—No. V.; Outlines of Geology (J. Barkell); Stone Ore Breaker (M. Boundy); Slime Dressing—Tin and Lead Ores (A. Francis); Separation of Minerals (R. Southey); Blakely Hall Collieries; West Chiverton, and New Machinery (R. Southey); Silver in the Callington District; Prince Royal Mining Company; Cardiganshire Mines, A.D. 1877—No. VI. (A. Francis); Lead Mining in Wales; West Cork Mines, Ireland (W. Thomas); Van Consols Mines; North Laxey Mines; Pedn-an-drea Mines, and Mr. Granville Sharp (W. Tregay); Barnardian Rhapsodies; Ashamed of his Profession; Richmond Mining Company—Registration of New Companies—the Scotch Mining Share Market—the Coal Trade—British Ironmasters in the United States—Treatment of Argentiferous Pyrites—Improvements in Blast-Furnaces—Atmospheric Brakes—the Mineral Resources of Virginia—Foreign Mining and Metallurgy—St. John del Rey Mining Company—Foreign Mines—the Wild Duck, or Sportsman's Arms—Manufacture of Iron and Steel—New Process for Making Steel—Patent Matters—Meetings of Marbella, Antioquia, Great Wheal Eleanor, Bedford United, Great Wheal Vor Companies, &c.

The Mining Market: Prices of Metals, Ores, &c.

METAL MARKET—LONDON, MARCH 9, 1877.

IRON.	£ s. d.	£ s. d
Pig, GMB, f.o.b., Clyde..	2 14 3-	2 14 6
,, Scotch, all No. 1 ...	2 17 0-	3 5 0
Bars, Welsh, f.o.b. Wales	6 0 0-	—
,, ,, in London.	6 10 0-	6 15 0
,, Stafford., ,, .	7 15 0-	8 15 0
,, in Tyne or Tees ...	6 2 6-	6 7 6
,, Swedish, London ..	10 10 0-	11 0 0
Rails, Welsh, at works..	5 10 0-	—
Railway chairs	— —	—
,, spikes	— —	—
Sheets, Staff., in London	9 5 0-	9 10 0
Plates, Staff., in London	9 5 0-	—
Hoops, Staff. ,,	7 15 0-	8 15 0
Nail rods, Staff. in Lon. ,,	10 0-	8 0 0
STEEL.		
English, spring	14 0 0-	23 0 0
,, cast	25 0 0-	45 0 0
Swedish, keg.....	17 0 0-	—
,, fag. ham.	17 10 0-	18 10 0
LEAD.		
English, pig, common .	21 5 0-	21 10 0
,, ,, L.B. nom.	21 12 6-	—
,, ,, W.B.	22 5 0-	nom.
,, sheet and bar..	22 10 0-	22 12 6
,, pipe	23 0 0-	—
,, red	23 10 0-	—
,, white	28 0 0-	29 10 0
,, patent shot ..	24 10 0	24 15 0
Spanish.....	29 15 0	29 17 6
QUICKSILVER.		
Flasks of 75 lbs., ware.	7 5 0-	—
SPELTER.		
Silesian or Rhenish ..	20 12 6-	20 15 0
English, Swansea	22 10 0-	—
Sheet zinc	24 10 0-	26 0 0

TIN.	£ s. d.	£ s. d
English, ingot, f.o.b...	75 0 0-	—
,, bars ,, ...	76 0 0-	—
,, refined.....	77 10 0-	—
Australian	70 10 0-	—
Banca	73 0 0-	—
Straits	71 10 0-	72 0 0
COPPER.		
Tough cake and ingot.	76 0 0-	77 0 0
Best selected	78 0 0-	—
Sheets and sheathing.	81 0 0-	84 0 0
Flat Bottoms	86 0 0-	88 0 0
Wallaroo	77 0 0-	—
Burra, or P.C.C.	75 0 0-	—
Other brands	75 0 0-	—
Chili bars, g.o.b.....	70 0 0-	nom.
PHOSPHOR BRONZE.		
Bearing metal	£112 0	0
Other alloys	£120 0 0-	140 0 0
BRASS.		
Wire	8½d.-	9½d.
Tubes.....	10½	- —
Sheets	9	- —
Yel. met. sheath. & sheets.	7	- 7¾
Nails composition.....	8¼	- 9¼
TIN-PLATES.*	per box.	
Charcoal, 1st quality ...	1 2 6-	1 3 6
,, 2nd quality ...	1 1 0-	1 1 6
Coke, 1st quality	0 19 6-	—
,, 2nd quality	0 18 6-	—
Black .....per ton	16 0 0-	16 10 0
Canada, Staff. or Gla., at Liverpool	13 0 0-	13 0 0
Black Taggers, 450 of 14 × 10	30 0 0-	—

* At the works, 1s. to 1s. 6d. per box less for ordinary; 10s. per ton less for Canada; IX 6s. per box more than IC quoted above, and add 6s. for each X. Terne plates 2s. per box below tin-plates of similar brands.

REMARKS.—Our markets continue extremely quiet, and prices have shown further evidence of weakness, and the apparent indifference of buyers to avail themselves of existing prices sufficiently marks their opinion of the improbability of any immediate upward tendency. But some go even further than this, and do not believe in the maintenance of current rates, but think they will descend to a still lower standard; and they are supported in this view by the slackness of trade and the increase in stocks, but most of all by the warlike attitude of Russia and Turkey. The markets have certainly fallen into a very low state, and it may yet take time before they fully recover; but notwithstanding the causes of depression above referred to, there is hope that an amendment is not so distant as many imagine; it only wants a change of feeling and the markets would very soon right themselves, and if the Eastern question could only be satisfactorily arranged there would be no fear of the peace of Europe being disturbed, and in that case commerce would be free to develope without interruption, and the additional impetus that would thereby be given would very soon have a beneficial influence upon prices, and speculation might drive them up much quicker than they came down.

The retrograde movement has now been going on for a long time at an enormous cost to importers, and this sort of thing must sooner or later come to an end, for unless imports can be sold to a profit merchants will cease importing, and miners will have to take the risk of the markets upon themselves, and bear the losses arising from over production. The importations have not decreased in proportion to the reduced consumption, and thus our markets have become rather overweighted and prices depreciated. This circumstance is most unfortunate for our producers, but on the other hand it is considerable advantage to the consumer, and as the latter a few years ago were great sufferers by the exorbitant prices then demanded, so now in their turn are they the gainers by the low prices. The ordinary demand is decidedly inadequate to the occasion, and it is necessary to provide and open up new sources of consumption, and as cheap prices invariably bring articles more into general consumption, so we may expect, as prices decline, new outlets to be gradually discovered to absorb the excessive supplies of metals.

At the moment our markets undoubtedly are dull, and prices for a time may continue easy, but there is a good prospect ahead, and he who has patience and strength to wait will realise it. There are three things to bear in mind that cannot fail to produce a good effect—the first is low prices, and these we have already: the second is cheap money, and that we also have; and the third is peace, and that will follow if Turkey would constitute Bulgaria, Bosnia, and Herzegovina tributary States, and place them upon an equality with the adjoining Principalities.

COPPER.—The decline in the value of this metal daily increases, and there seems no limit at present to the reduction. The confidence which importers showed in the market by adhering to their stocks has suddenly disappeared, and several large lots of Chili have recently been sold, but although a considerable business has been transacted, yet prices still go lower, and sellers seem now quite resolved to sell out as fast as possible. The price leaves an enormous loss, but still holders know it is no use taking that into consideration; the copper must be realised at any cost, whatever the state of the market may be. It is useless under present circumstances for importers to follow out their previous quiet orderly manner of effecting sales, and waiting until the wants of consumers created a demand. That mode of selling has passed away. We have arrived at quite a different stage now. A revolution has taken place in the copper trade, and some sellers seem bent upon effecting their own destruction and disregarding the interests of the whole trade. The course they are adopting is suicidal, and they will have to pay bitterly for their experience, but that is lost upon consumers; they look on with amazement to see such folly, and laugh to behold the rivalry of sellers, and wonder how long it will last. Nothing could destroy the confidence of buyers more, nothing could annihilate the interest of miners, importers, dealers, and sellers generally so much as a continuous system of forced sales. While these are persisted in the market will remain in a hopeless sinking condition, and the greater the fall the weaker will it become, for the advances on copper are heavy, the margins are rapidly vanishing, and the position of holders is daily growing critical. Many realisations will have to be made unless further margins are provided, and it seems as if a very unsettled period lies before us. While sellers are frantic buyers must be cautious, and wait awhile to see to what extent their excitement will carry them. At the rate sellers are going on Wallaroo and Burra will very soon reach 70*l.*, and then, perhaps, they will come to their senses, and stop their wild career. Chili has been sold at 69*l.* 12s. 6d., short prompt. Burra is quoted 75*l.*; Wallaroo, 77*l.*; tough, 76*l.*

IRON.—There has been a slightly easier market all round, and prices still tend downwards. It is really marvellous, considering the excessive competition of Belgian masters, that our market should have held its position so long; and it is equally strange that, after having gone so well through December—proverbially the dullest month of the year—as well as the remainder of the winter quarter, that now we have entered the first spring month, when trade usually begins to revive, prices, instead of advancing, are receding. The weather having been continuously wet for so many months must have made a great difference in the requirements for building purposes; but now that the weather seems to have taken a turn we may naturally look forward to an increased demand for such kinds of iron as angles, T's, and plates. Not only has builders' work been impeded, but the construction of bridges and all repairs of one kind and another have been delayed. As soon as ever the weather admits—and the March winds will soon dry up the country—all necessary work will receive prompt attention, and we hope to see our manufacturing districts again busily engaged. The price of pig-iron has declined, but is still too high in proportion to the prices to be obtained for manufactured. A low price for pigs would be a great boon to the community; and, as the demand is much reduced, it is not improbable that lower prices will have to be accepted. The impression gains ground that the first sign of general improvement must show itself in the iron market; and if this opinion is correct we fear the time is not so near for a revival as could be desired, and greater disappointment will have to be endured. The Board of Trade returns for February are commented upon as being very unfavourable; but with regard to iron, although the value is less, yet the quantity exported has slightly increased, and this we think is rather a hopeful sign than otherwise. It is an increased demand which is so urgently needed, and if it is necessary to reduce the price to secure an increase there is no alternative but to comply. Iron will and must be produced cheaper; everything else is depreciated, and that, amongst other staple commodities, must rule lower. Scotch pigs to-day are quoted 54s. 3d. to 54s. 6d.

SHIPMENTS.

Week ending March 4, 1876 ..... Tons	9,644
Week ending March 3, 1877	8,630
Decrease	1,014
Total decrease for 1877	5,320
Imports of Middlesborough pig-iron into Grangemouth:—	
Week ending March 3, 1877 ..... Tons	4,381
Week ending March 4, 1876	4,190
Increase	191
Total increase for 1877	12,213

LEAD.—The firmness of the market continues, and sellers sustain prices against all attempts to reduce them. Spanish has been sold at 20*l.* 17s. 6d.

SPELTER.—Silesian is quoted 2s. 6d. to 5s. per ton lower than last week.

QUICKSILVER.—Business on a moderate scale has been done at 7*l.* 10s. for Spanish until to-day, when 7*l.* 5s. was accepted.

TIN-PLATES.—The demand keeps sluggish, and prices show no signs of advance.

TIN.—Our market closed last week at 71*l.* 10s. for Straits, and 70*l.* 5s. Australian, and on Monday the only change was 5s. less for Australian. On Tuesday Straits declined to 71*l.*, but recovered 5s. on Wednesday. The next sale of Banca in Holland is fixed for the 28th inst., when 23,500 slabs will be brought forward. Yesterday there was a stronger feeling, and 71*l.* 10s. was paid for Straits on the spot, and 72*l.* for arrival. Australian participated in the advance, and realised 70*l.* 5s. to 70*l.* 10s. The market closes to-day at 70*l.* 10s. for Australian, and 71*l.* 10s. Straits.

THE IRON TRADE—(Griffiths's Weekly Report).—Friday Evening. The downward movement continues on the Glasgow Exchange; warrants for g.m.b. iron close this afternoon 54s. 4d., a loss on the week of about 1s. per ton. We quote makers' No. 1 iron—Gartsherrie, 62s.; Coltness, 65s.; Calder, 63s.; Langloan, 63s.; Summerlee, 60s. 6d.; Monkland, 56s. 6d., f.o.b. Glasgow; Glengarnock, 60s. 6d.; Eglington, 57s., f.o.b., Ardrossan; Shotts, 62s. 6d., f.o.b. Leith; Kennfel, 57s., f.o.b. Bo'ness. As we approach the shipping season enquiries for Yorkshire and best Staffordshire bars are more numerous. We cannot say that a large business has been done even in these kinds. There is an evident absence of activity in our market for general kinds of iron, which clearly indicates that the iron trade is languid in all departments. The raw material continues weak, and slightly descending in value in Middlesborough and Glasgow. Stocks are increasing at the latter centre. At the Birmingham Exchange yesterday the meeting was moderately attended. The assembly was cheerful, but the hopes expressed in future prospects were not sanguine. The stoppage of Mr. Samuel Whitham, the Calder Vale Ironworks, Wakefield, was mentioned and commented upon at Birmingham. The tin-plate trade continues depressed. The price of iron rails is firmer. The market for tin, copper, and spelter, is struggling against the absence of buying; orders and prices are weak all round.

MESSRS. SANFORD AND BIRD—COPPER: Foreign has relapsed, and closes 20s. to 30s. per ton lower than last week. English manufactured is unchanged.—TIN has declined about 20s., but closes with more enquiry at the lower rates. English is dull.—TIN-PLATES remain quiet, with little doing.—LEAD is somewhat firmer.—QUICKSILVER remains at 7*l.* 10s. per bottle.—ANTIMONY is dull at 54*l.* for English.

MESSRS. GRENFELL AND RICKARD—The continued state of harassing suspense as to the Turkish difficulty tells each day more seriously on our staple commodities. The downward course of copper has been, no doubt, expedited by the quantities forced on the market by public auctions. There is to be another auction on the 20th inst., when the usual quantity of Wallaroo, and 400 tons of Burra, will be offered. Prices on the West Coast have given way so much that importers can now sell bars here at current quotations without loss. There is some hope that now the President is elected in America trade will revive there, and this would improve the position of both metals. The delivery of foreign Tin out of warehouse, London and Holland, is—Jan. 1 to Feb. 28, 1877, 2700 tons, against 3080 tons in 1876, and 2800 tons in 1875. The stock of tin here and in Holland is—Feb. 28, 1877, 12,600 tons, against 10,680 tons in 1876, and 9550 tons in 1875. The shipments of Straits and Australian to London during the first two months of 1877 were 2580 tons, against 2990 tons for same time 1876. Lead is steady, and a fair business doing. Iron; No improvement to notice. Prices weaker.

The MINING SHARE MARKET, on the whole, shows no particular change since our last, though early in the week there was a somewhat improved tone, and what proved to be but a temporary demand for a few prominent lead mines. Quotations, as usual, are mostly nominal.

There appears to be no change in tin, but the standard for copper ores declined 1*l.* per ton at the Cornish Ticketing on Thursday.

The mines dealt in in the market embrace Van, Van Consols, Great Laxey, North Laxey, Glenroy, Pateley Bridge, East Van, Leadhills, Rookhope, Wheal Crebor, South Condurrow, Glyn, Roman Gravels, Tankerville, West Tankerville, and others.

In TIN MINES there has been scarcely any business doing, though South Condurrow have been slightly in demand, at an advance to 6¼, 6¾. Dolcoath, 35 to 37½; Carn Brea, 35 to 37½; South Crofty, 15 to 16; Tincroft, 19 to 21; West Basset, 3½ to 4; West Frances, 4½ to 5; Wheal Agar, 3½ to 3¾; Wheal Kitty, 2½ to 3; Wheal Uny, 1¾ to 2; West Godolphin, 2½ to 3; East Pool, 10 to 11; Cook's, Kitchen, 2½ to 3; New Cook's Kitchen, 2¾ to 3. South Frances 17s. 6d. to 20s.

Relistian Consols, ½ to ¾; the 10 has been driven 40 fms. east, the end worth 5*l.* per fathom for several fathoms long; and in the bottom of the end going down the lode is worth, at the present price of tin, 15*l.* to 20*l.* per fathom. The 24 will be driven up to this ground as quick as possible, and open out a large extent of tin ground. In a few fathoms of ground above the 10, tin was obtained which sold for 3000*l.* and upwards. At Great Wheal Vor meeting it was determined to stop the mines, and wind up the company. The mines have been worked since the days of Queen Elizabeth, and have made enormous returns. The present company commenced in 1853. At Penhalls meeting, the accounts, charging costs to November last, showed a balance in favour of the mine of 45*l.* 19s. 2d. The tin sold to March 3, 67 tons 17 cwts., realised 2910*l.* 3s. 6d. The report states that the mine is producing the usual quantities of tin, but the price obtained for it is not remunerative. At Blue Hills, a call of 2s. 6d. a share was made. The balance against the mine was 781*l.* 18s. 10d., and the report of the mine considered favourable.

COPPER MINES are quiet. Devon Great Consols, 4 to 4¼; in the 175 cross-cut south the lode has been cut into 8 ft., and the south wall not yet reached; the leader is worth 2 tons of ore per fathom. The sampling on March 2 was 820 tons of copper ores for the month. Wheal Crebor, 2¾ to 3; the 120 east is now worth 15*l.* per fathom. Cathedral, 20s. to 30s.; East Caradon, 1 to 1½; Hingston Down, 7s. 6d. to 12s. 6d.; Marke Valley, 1 to 1¼; Parys Mountain, 9s. to 11s.; Penstruthal, 11s. to 13s. Bedford United, 12s. 6d. to 17s.; at the meeting the accounts (in referring to which last week we made an important clerical error in stating the balance of liabilities over assets at 34,116*l.*; it should have been 341*l.* 1s. 6d.) were passed, and a call of 2s. per share was made. Prince of Wales, 3s. to 4s.; West Seton, 27½ to 32½; West Tolgus, 59 to 60.

In LEAD MINES Great Laxey, 20½ to 21½. North Laxey, 16s. to 18s.; in the 121 winze the lode is worth 15 cwts. of lead per fathom. In the south ground the 50 end standing in whole ground going south is worth 1 ton of lead per fathom. The 50 stopes 1 ton. The 40 end worth 15 cwts. The weather has lately interfered very much with dressing and surface operations at these mines. Glenroy, 1½ to 2; there is an improvement here. The north lode is the full width of the adit, and rich stones of ore have just been broken from it. West Chiverton, 18 to 19; West Craven Moor, 12½ to 13½. Roman Gravels, 13½ to 14; the lode in the 106 is worth 3 tons of lead per fathom. The 106 north 1 ton. The sampling for the month is 220 tons of lead. Tankerville, 8½ to 9. East Van have declined to 7½, 7¾; in the 25, west of Tempest shaft, there are nice stones of ore occasionally, but the end is not rich enough to value. The 25 east is not looking so well. West Tankerville, 1½ to 1¾; the 35 tons of lead and 20 tons of blende realised 59*l.* 2s. 6d. Rookhope, ½ to 1; this mine has sold 30 tons of lead ore for 403*l.* 2s. 6d. The price per ton is 8s. 3d. in advance of the last sale.

Aberdaunant, ½ to ¾; Assheton, 1½ to 2; Cargoll, 5½ to 6; Glyn, 1⅞ to 2½; Leadhills, 6½ to 6¾; Van, 36 to 38; Van Consols, 2¾ to 3⅛; Ladyweil, 1 to 1½; Pateley Bridge, 2½ to 3; Pennant, 5½ to 6; Pennerley, 14s. to 16s.; Llanrwst, 1¾ to 2; Bodidris, 1⅝ to 1¾. Gorsedd and Merllyn, 5 to 5¼; this mine sold on Thursday 50 tons of lead ore from the late discovery, at 15*l.* 16s. 6d. per ton—791*l.* 5s. Trebeigh Consols, 7s. to 9s.; Combmartin, 10s. to 15s. Clementina, 30 to 40; a great improvement has taken place in the 25 end, where, in the bottom, the agent reports it worth 1½ ton per fathom. There is also a good lode in the shaft, which is now down to the 30. D'Eresby Mountain, 20 to 30; the intermediate level has been cleared out 20 fathoms, and a fine lode discovered, for 20 fathoms long. The agent's report values the end at 10 cwts. of lead and 1 ton of blende per fathom, and could at once, he says, put on 12 men to stope good paying ground. This level and a deeper one will open out a great quantity of ground. Grogwinion, 4½ to 5¼; the mine sold 100 tons of lead ores last week, at 14*l.* 17s. 6d. per ton, the produce of one month. Grogwinion, new shares, 2½ to 2¾; Red Rock, 2¼ to 2¾; South Cwmystwith, 3½ to 4; new shares, 10s. to 12s.; St. Harmon, 3 to 3½; Wye Valley, 5 to 6; West Wye Valley, 3½ to 3¾; West Goginan, 5s. to 15s.; pref. (1*l.* paid), 1 to 1½.

FOREIGN MINES.—Argentine, 5 to 5½; Condes, 4¾ to 5¼; Blue Tent, 3 to 3½; Almada, 6s. 3d. to 8s. 9d.; Cedar Creek, 11s. 3d. to 13s. 9d.; Chontales, 6s. 3d. to 8s. 9d.; Don Pedro, 9s. to 11s.; Eberhardt and Aurora, 8¾ to 9; Exchequer, 1½ to 1⅝; Flagstaff, 3⅜ to 3¾; Frontino and Bolivia, 1⅞ to 1⅝; I.X.L., 16s. 3d. to 18s. 9d.; Javali, 8s. 9d. to 11s. 3d.; New Zealand Kapanga, 2½ to 2⅝; Last Chance, ⅜ to ½; Malpaso, ⅜ to ½; New Quebrada, 4½ to 4¾; Port Phillip, 8s. 9d. to 11s. 3d.; Richmond, 6⅜ to 6⅝; San Pedro, 15s. to 20s.; Santa Barbara, 2½ to 2⅝; South Aurora, 1½ to 1⅝.

The Market for Mine Shares on the Stock Exchange during the week has been again without animation; quotations, however, have been fairly maintained, and an advance established in some instances, especially in home lead mines. The foreign department has been chiefly represented by St. John del Rey, which upon recent advices has fully recovered the decline.

New Zealand Kapanga, 2½ to 3; the advices this week, *via* San Francisco, continue very satisfactory. The agent was pushing on towards the Albion shute of gold, and sinking the winze towards the No. 6 level; the whole of the operations were being pushed on in an encouraging manner, and will doubtless result in good returns when sufficiently advanced. A telegram received during the week, bringing up advices to end of February, states that all operations at the mine were progressing satisfactorily. It is considered that New Zealand promises to take a prominent position as a mining country. The prospects for gold have already been referred to, and it is now stated that prospecting for gold and coal are going on in the Upper Wanganui district; whilst another rich silver lode, yielding 340 ozs. to the ton, has been struck in the Mount Rangitoto Mine 9 ft. below the present working, and a large reef 10 ft. thick of porphyritic quartz impregnated with silver has been opened upon within the company's lease, and about ¼ mile from the present working. The preparations being made will permit of large quantities of ore being stoped. Hornachos, 13¼ to 13⅝; it is stated that the total applications for the 2000 additional 10*l.* shares issued by this company reached 5907 shares, or 59,070*l.* This issue was confined exclusively to the shareholders, no applications from the public being received.

St. John del Rey, 270 to 320; the telegram received on Tuesday gives the produce for the second division of February (11 days) at 8500 oits., the ley of the ore being 5·1 oits. The continuance of the temporary admixture of quartz and killas is given as the reason of the small produce, but there is the important addition, all is going on well. There is nothing in the superintendent's letter received on Monday to cause uneasiness regarding the mine. The directors also state that there is not the remotest foundation for the report which is being very industriously circulated by parties interested in the sale of another mining property in Minas Geraes that the directors of St. John del Rey have been in treaty for it. They have never even given the matter a thought, for they are quite satisfied to devote their attention to the Morro Velho Mine alone. The directors are not in possession of any further information than that contained in the telegrams. The Taquarassu and Lages road was stopped by land slips caused by floods; and there being no local labour slaves were sent from Morro Velho, and it was expected to be opened on Feb. 3.

Argentine, 5⅛ to 5⅜; the lode in the 44 south, in the Piqué Mine, is reported to be opening into a rich course of ore. Thus the ends north and south, and the sinking below the 44, are all in rich ore. At the meeting, on Wednesday, the resolution for creating 20,000 new ordinary shares, to be issued at directors' discretion, at premium or discount, or in exchange for debentures, was confirmed. Condes, 4¾ to 5¼; advices are due by the Pacific mail next week; from the latest accounts the mine is opening up well. Richmond, 6¼ to 6⅜; the usual weekly telegram states the week's run at $12,000. The refinery this week has produced doré bars to the value of $32,000. The manager's report for the past and present week arrived nearly together. Work was resumed on the 600 and 700 drifts. The 600 has been extended 40 ft. more, and the rising from it to connect with No. 2 winze is in good ore. The 400 is opening out well, but the extent of the ore body at this point is not yet known, as the cross-cut is not yet made. Stopes in all parts of the mine looking about the same. All the furnaces are in full blast, and still in good order. The injunction obtained against the Richmond Consolidated Mining Company (Limited) was dissolved on Feb. 11, on the ground that the proper defendant was the Richmond Company of Nevada. An *ex parte* injunction has since been granted against the latter company, who on their part have obtained an injunction against the Eureka Consolidated Company. Both these suits will shortly be tried.

Eberhardt and Aurora, 8¾ to 9; a telegram announces that some ore has been found in the drift east from the old ore body, and the incline was looking favourable. Exchequer, 1½ to 1⅝; a telegram is daily expected from the manager that Mr. O'Hara, whose furnace works by machinery, has made the necessary connections between that and the quartz-mill, preparatory to starting work. The weather continued open, and the manager was about to recommence hauling ore. The mine continued to look well. I.X.L., ¾ to 1; favourable indications increase in the 200 ft. level, and it is thought that there is little doubt that in a week or two the bonanza will have been struck.

Flagstaff, 3⅜ to 3¾; it is stated that the Flagstaff has put into form an old judgment against the Last Chance for $25,000, and that as that sum is not likely to be paid off the mine may shortly fall into the hands of the Flagstaff. It is considered to be a property of merit, and with its furnaces and machinery would make a valuable addition. The mine continues to open out well, and the daily yield is increasing. Other advices state that the output for February amounted to 2000 tons—a result never before realised in the history of the mine. The old claim having been revived, the Flagstaff Company has been put into possession of the Last Chance Mine and property, thereby securing assets sufficient to pay at least one fourth of the gross indebtedness of the company; this claim had been regarded as an absolutely bad debt. Mr. Hunter, the representative of the Flagstaff Company in Utah, has also secured for $7000 three-fourths of the South Star and Titus Mines, the entirety of which an eminent expert recently valued at 100,000*l.* This is considered to assure the Flagstaff Company an important extension upon the vein, and sets at rest any possible litigation that might have otherwise arisen.

The market for Hydraulic or Gold Washing Shares has been steady, and shares maintain their price. One of the companies represented on this market has received news of their first clean-up, and it is anticipated others will follow in a similar manner very shortly. It is stated that to properly work the deposits of auriferous gravel, in many cases very long tunnels have to be driven. The Boston tunnel, on Woolsap Flat, 1600 feet long, cost $40,000; the North Bloomfield, at Humbug Canyon, 8000 feet, $500,000; American, San Juan, 3900 feet, $140,000; Mauganita, Sweetland, 1740 feet, $62,000; Sweetland Creek, 2200 feet, $90,000; and French Corral, 3500 feet, $165,000. Besides these there are several in course of progress, and others will be required as further deposits of gravel are opened up. The Yankee tunnel of the Cedar Creek Company, which is already 2200 feet in length, has thus far cost about $57,000. The aggregate amount thus expended swells into an enormous total, and shows the confidence of American capitalists in this class of mining. Blue Tent, 3 to 3½; at the date of last advices washing was progressing at South Yuba and Enterprise. The manager states that with a moderate winter he is satisfied that he will be able to make an unusually good record, as every day's work is placing the property in a better position, and enabling him to do more profitable work. Birdseye Creek, ⅜ to ½; a telegram received during the week states that the agent has cleaned-up the

Neece and West claim after a run of 35 days; gross return, $5250: profit, $1000. At the date of advices the superintendent had only had a full supply of water for three days, and consequently steady washing was only being carried on in the Neece and West claim. The low result of the run just telegraphed is said to be probably due to the fact that only the top dirt loosened by the blast has been worked, leaving the richer bottom gravel to come in on next run. The almost unparalleled dryness of the season in California has operated prejudically against all hydraulic mines, especially those which, like Birdseye, derive their water supply from low down the sierras. Cedar Creek, ½ to ¾; the superintendent details the work in progress. The commencement of the wet season had enabled him to start washing on several claims. The annual meeting of the company was held yesterday. The company have not made any profits in the year ending Oct. 31, 1876, but this is accounted for by the agent in his report. The prospects for the coming season are considered the most encouraging the company have been able to look forward to for some time past. Oregon, 4 to 4½; washing has been resumed at this company's mines with all the water at command. The latest advices say that the rains have just set in. The annual report of the North Bloomfield Gravel Mining Company for 1876 shows that the company were enabled to wash with but slight interruptions from Nov. 13, 1875, until Oct. 15, 1876, when the water became exhausted, the gross yield being $200,366 54, and the profit $98,476·28. The amount of water actually used at the mines was 823,000 in. for 24 hours, and the yield of gold per inch of water was equal to about 27½ cents. From the principal claim nearly 3,000,000 cubic yards of gravel was washed during the year, and 700,000 miners 24 hours inches of water was used, or about 19 cubic feet of water to move 1 cubic foot of gravel. This company has been in existence some years, but have only just finished the gigantic works required to enable them to deal with their auriferous gravel, are now commencing to reap the result of their enormous outlay, nearly $2,500,000 to date.

The shares in lead mines have been more active. Van, 36 to 38, the usual monthly report is very good, and all operations are progressing satisfactorily. The monthly sale on Thursday, 500 tons lead, and 200 tons blende, realised 8347*l*. 10s. Van Consols, 2⅞ to 3⅛; the level driving west of the new drawing shaft, at the bottom of the mine, is in lead ore for 11 ft. in width, and it is thought that in a short time substantial returns of ore will be made. Glyn, 1⅞ to 2⅛; Capt. Roach continues to speak strongly as to the future of the mine. Pateley Bridge, 1¾ to 2¼; the 30 east, on Rake vein, has further improved, and the indications are strongly in favour of soon meeting something of importance; the same level west is also looking very encouraging. Other parts of the mine are looking better.

Penstruthal, 11s. to 13s.; a rich course of copper is being looked forward to as the bottom levels are extended; 7½ tons of tin were sold this week. Cathedral, 20s. to 30s.; the shaft is now down to a 62 fm. level under adit, and two levels east and west are being vigorously pushed forward on the course of a promising copper lode. The cauter lode will, it is expected, be cut this month.

Subjoined are the closing quotations:—

Assheton, 1½ to 2; Cara Brea, 36 to 38; Devon Great Consols, 3¾ to 4¼; Dolcoath, 36 to 38; East Caradon, ¾ to 1; East Van, 7¼ to 7½; Glyn, 1⅞ to 2⅛; Great Laxey, 20 to 21; Great West Van, ¼ to ½; Hingston Down Consols, ½ to ¾; Leadhills, 6 to 6½; Marke Valley, ⅜ to 1⅝; Parys Mountain, ⅜ to ⅝; Pateley Bridge, 1¾ to 2⅛; Pennerley, ⅝ to ⅞; Penstruthal, ⅛ to ⅜; Roman Gravels, 13¾ to 14½; Tankerville, 8¼ to 8¾; Tincroft, 19 to 21; Van, 36 to 38; Van Consols, 2⅞ to 2⅞; West Assheton, 1⅜ to 1⅝; West Wheal Basset, 3½ to 4; West Chiverton, 17½ to 18½; West Pateley Bridge, 1 to 1¼; West Tankerville, 1½ to 1¾; Wheal Crebor, 2½ to 3; Wheal Grenville, ⅝ to ⅞; Almada and Tirito, ¼ to ½; Argentine, 5 to 5½; Birdseye Creek, ½ to ¾; Blue Tent, 3 to 3¼; Cape Copper, 40 to 42; Cedar Creek, ½ to ¾; Chontales, ¼ to ⅜; Colorado Terrible, 1¾ to 2; Condes of Chili, 4¾ to 5¼; Don Pedro, 8s. to 10s.; Eberhardt and Aurora, 8¾ to 9; Emma, ⅜ to ½; Exchequer, 1½ to 1¾; I.X.L., ¾ to 1; Flagstaff, 3¼ to 3½; Frontino and Bolivia, 1⅜ to 1⅝; Javali, ⅜ to ½; Kapanga, 2½ to 3; Last Chance, ½ to ¾; Malpaso, ¼ to ½; Malabar, ½ to ⅞; New Pacific, ½ to ¾; New Quebrada, 4 to 4½; Pestarena, ⅜ to ¾; Plumas Eureka, 2¼ to 2¾; Rica, ⅛ to ⅜; Richmond Consolidated, 6⅜ to 6⅝; St. John del Rey, 300 to 320; San Pedro, ¾ to 1; Sierra Buttes, 1½ to 1¾; South Aurora, 5s. to 7s.; Tecoma, ⅜ to ⅝; United Mexican, 2 to 2½.

At Redruth Ticketing, on Thursday, 1336 tons of copper ore were sold, realising 5692*l*. 18s. 6d. The particulars of the sale were—

Date.	Tons.	Standard.	Produce.	Per ton.	Per unit.	Ore copper.
Feb. 1..	1224	£ 99 19 0	7¾	£5 2 6	13s. 0d.	£65 0 6
„ 22..	2694	106 2 0	6¼	3 19 0	12 6	62 10 6
March 8.	1336	101 9 0	6¾	4 5 0	12 4	61 13 6

Average standard, 101*l*. 9s.; average produce, 6⅞; average price per ton, 4*l*. 5s.; quantity of fine copper, 92 tons 6 cwts. The following are the particulars:—

Compared with the last sale, the decline has been in the standard 1*l*., and in the price per ton of ore about 1s. 4d.

It is announced that a second dividend, of 3s. 4d. in 1*l*., has been declared to the creditors of the Welsh Steam Coal Collieries, by the liquidator, Mr. H. Wilson, Bartholomew House.

A petition has been presented to the High Court of Justice for the winding-up of the Canadian Land Reclaiming and Colonising Company (Limited).

YNISCEDWYN IRON, STEEL, AND COAL COMPANY (Limited).—The creditors of this company are required before March 29 to send their addresses and the particulars of their debts or claims, and the names of their solicitors to Mr. Samuel Lowell Price, of Gresham-street, public accountant, the official liquidator of the said company.

VAN CONSOLS.—This mine is opening out well, and shares are in request at 25s. to 27s. 6d. in advance of last week's quotations. The lode in the 90 is worth fully 80*l*. per fathom, and promises to improve, especially westward. The vein is composed of a strong mixture of lead for 10 ft. in width, with a solid leader, yielding 3 tons to the fathom, on the footwall.

CATHEDRAL.—This copper mine is now being developed in a practical as well as a profitable manner, and already 4000*l*. worth of ores have been sold from sinking the shaft alone under the large deposit of gossan that held down for 30 fathoms in depth. A level is now being extended east and west at a depth of 65 fathoms from surface, and the lode shows increased strength and productive powers as length is attained.

WEST WHEAL SETON, we observe, has over 320 tons of copper ore for sale this week. Even in the present state of the metal market, counting in the sales of tin and arsenic, the mine ought to pay a dividend of 2*l*. 10s. a share at the meeting after next. The shares are well held, and the mine is looking splendid.

WEST WHEAL SETON.—We learn that the end in the 150 fathom level is very rich, where they have a large bunch of ore; and, although the shares have receded a little, it is attributable to some being thrown on the market, and to the temporary depression of copper. The mine never looked better than at the present time. It will soon, it is expected, be paying dividends again as it formerly did, the division being only 600 shares.

GREAT WHEAL VOR.—The final determination to close this mine by confirming the resolution on Monday has caused much regret in Cornwall, as until the managers actually received the orders to commence drawing up the materials, and to raise everything as quickly as is compatible with safety, hopes were entertained that it would be sold as a going concern. The low price of tin has, no doubt, much to do with the stoppage of the mine, but in the face of the constantly increasing production of Australian tin it is scarcely to be desired that attempts should be made to re-open it at least for many years to come, as the capital that would be required could be much more advantageously employed elsewhere in the county. The working of the Great Wheal Vor can be traced back to the time of Queen Elizabeth, and the present company has been in existence for nearly a quarter of a century, having been inaugurated through the energy and influence of Mr. Henry Pellew Crease and his friends in 1853, previous to which the mines had remained idle for 10 years. As the shareholders are at present incurring 70*l*. per month for keeping the engine going no time will be lost in getting up the materials, so as to stop that outlay, as the avoidance of a further call depends upon arrears coming in quickly and materials fetching a fair price. It is also suggested that unless the price of tin improves other mines in Cornwall must necessarily stop, as it is only where the expenses are very light indeed that a mine can pay a dividend, and there are just now very few such mines. It is estimated that at the present time there are at least 1500 tons of black tin stocked in Cornwall in connection with first-class mines. This amount of tinstuff, at 40*l*. a ton, represents a sum of 60,000*l*., which at 5 per cent., would yield a profit of 3000*l*. per annum. It is now lying as dead stock on the floors of the mines, and is constantly becoming of less value; and it is believed that one mine has thus been losing at the rate of 1500*l*. or 1600*l*. a year for some time past.

CLEMENTINA.—Some fine rocks of lead ore have been received at the office this week, broken from the 25 end, which in the bottom is worth 1½ ton of lead per fathom. The old company raised large quantities of lead above the 25, and the present company started with the object of getting down the shaft to another level, and under this ore. The shaft is now down 5 fms. below the 25, and the prospects have much improved by this discovery. The mine is in only 128 shares, 20*l*. paid up, is worked inexpensively by water-power, and bids fair to make good profits when the shaft is down in a few months.

D'ERESBY MOUNTAIN.—The level which will intersect the Llanrwst and other lodes at a good depth has been cleared up 20 fathoms long, the lode upon which it has been driven being from 2 to 3 ft. wide the whole distance, and worth 2 tons of blende and 5 cwts. of lead per fathom. The agent recommends the erection of a water-wheel and crusher immediately, when regular returns can be made. The mine is in 512 shares, 10*l*. fully paid-up.

HOLMBUSH.—The February accounts are stated to show that 773 tons of copper and arsenical ores have been sold during the month for 1478*l*. 2s. 6d., against costs amounting to 994*l*. 9s. 7d.—a result which has enabled a further dividend of 6d. per share to be paid upon the shares issued, which is calculated to be at the rate of 30 per cent. per annum.

WHEAL PEEVOR.—The pumping-engine was put to work at this mine on the afternoon of Feb. 14, and in 19 days the whole of the extensive workings have been drained to the bottom. Considering the time of the year in which this work was undertaken, and that the plunger and other lifts were all under water, this is looked upon by pitmen and other practical persons as one of the most successful attempts ever made to re-work a mine drowned by a sudden influx of water. The machinery, both at surface and underground, was in such perfect order that not the slightest hindrance took place during the 19 days the work was in hand, and the 60-in. engine made ten strokes per minute continuously during the whole of that period. The miners have resumed their work, and it is intended to immediately recommence sinking the engine shaft, where there is a lode yielding 1 ton of black tin per fathom. With a little better price for tin this mine would soon be in a position to pay dividends.

CORNISH PUMPING ENGINES.—The number of pumping-engines reported for January is 17. They have consumed 2180 tons of coal, and lifted 17,700,000 tons of water 10 fms. high. The average duty of the whole is, therefore, 54,000,000 lbs., lifted 1 ft. high, by the consumption of 112 lbs. of coal. The following engines have exceeded the average duty:—

Dolcoath—85 in.	Millions 54·5
Mellanear—76 in.	57·3
West Wheal Seton—Harvey's 85 in.	57·8
Wheal Unity Wood—70 in.	66·1

Notices to Correspondents.

*** Much inconvenience having arisen in consequence of several of the Numbers during the past year being out of print, we recommend that the Journal should be *filed* on receipt; it then forms an accumulating useful work of reference.

CALLS IN COST-BOOK MINES—"Z. C." (Villiers street).—The 13th section of the Stannaries Act, 1869, provides that "the amount for the time being unpaid on any call . . . shall be deemed to be a debt due from the holder of such share to the company, and if at the time appointed by the company for the payment of any such call any shareholder shall fail to pay the amount thereof it shall be lawful for the company to sue such shareholder for the amount of such call in any Court of law having competent jurisdiction," and so on. Sect. 16 19 sanctions the forfeiture of shares for arrears of calls, and Sect. 20 authorises the recovery of calls, interest, and expenses, notwithstanding forfeiture. A defaulter cannot defraud the company because he happens to reside out of the Stannaries, as the order of the Stannaries Court is enforced by the officers of the County Court in whose district the defendant is found.

BEDFORD UNITED.—In the Journal of last Saturday it is stated that the balance against the shareholders at the coming meeting is 34,116*l.*, whereas a reference to the statement of account sent you will show that 341*l.* 1s. 6d. is the right amount.—T. B. LAWS: 28, *Cornhill, March* 5.

MINING IN THE EAST.—The paper on Copper Smelting in Servia will appear in next week's Journal.

Received,—"B. R. K." (Kansas City)—"J. H. M." (Washington)—"Shareholder" (Flagstaff) had better address his letter to Prof. Vincent, at the office of the company—he will, doubtless, rather furnish the information required privately than through a public journal—"Speculator:" We never give such matters attention. Select a broker upon whose judgment you can rely—"N. M."—"Doubt:" Your broker can arrange to have the mine inspected and reported upon by an independent agent—"S. D."—"Calstockian"—J. Thomas—"Investor" (Dublin)—"Empressario" (Maidanpek): Next week—"A. M. L."

IMPORTANT NOTICE—REDUCTION OF POSTAGE ON THE "MINING JOURNAL."—In consequence of the new POSTAL CONVENTION, which came into operation on July 1, the postage of the *Mining Journal* to many countries will be reduced to one fourth. Henceforth the subscription will be 1*l.* 10s. 4d. per annum (39 frs.), postage included, for the following countries. The amount will, if desired, be collected at the subscriber's residence at the end of each year. The subscription continues until countermanded:—Austria, France, Belgium, Denmark (including Iceland and the Faroe Islands), Egypt, Germany, Gibraltar, Greece, Heligoland, Italy, Luxemburg, Netherlands, Norway, Portugal (including Madeira and the Azores), Roumania, Russia, Servia, Sweden, Switzerland, United States, Malta' Turkey, Morocco, Tunis, and the Canary Islands. Spain 1*l.* 19s. (50 frs.)

THE MINING JOURNAL,

Railway and Commercial Gazette.

LONDON, MARCH 10, 1877.

COLLIERY MANAGEMENT.

Few questions affecting the welfare of the nation are of greater interest or importance than the working of our collieries. Every year the demand for the priceless black diamond increases, and as our trade and commerce expand, and the restless energies of our merchants open up fresh fields of enterprise, so will the demand grow, and our collieries be further taxed for the supply of an article which is the foundation of our national prosperity. It is quite possible—nay, probable—that mechanical appliances may yet be brought to bear in the cutting of coals, and thus proportionately diminish underground labour, but we shall ever require large numbers of men to carry out those multifarious duties connected with colliery operations which no scientific ingenuity can supply. The lives and comfort of these men must ever be the first duty, as it is the interest, of the proprietors to study and promote; and as most reforms and improvements are more effectually worked out in times of quiet rather than during seasons of excitement, we would now direct the attention of those interested to one or two subjects which we think of great importance to the safer and more economic working of our mines and collieries.

Every now and then the whole nation is thrilled by reading the details of some terrible colliery disaster which has suddenly sent some scores of men into eternity, and wrecked thousands of pounds of valuable property. Sympathy with the widows and bereaved is very properly evoked, and noble subscriptions raised to assuage the grief, so far as possible, which the loss of the "bread winner" entails. But these spasmodic efforts and this sympathy die out as quickly as called forth, and in a few months the collier and his condition are forgotten amidst the thousand and one calls and duties of active everyday life. But it is not these terrible explosions (awful and distressing though they are) which are the collier's greatest enemy, nor are the temporary seasons of excitement and sympathy the time when he most hopefully turns to public opinion for relief, and looks for assistance to render his arduous duties more safe and his daily task less irksome. Those who are engaged in colliery operations know too well that it is the falls in the roof or of coal, or the accidents in shafts that carry off by far the greater number; and they know, too, that it is only by keeping these facts before the public mind that they can hope for the initiation of those practical measures which are necessary to promote greater safety.

We have long been seriously impressed with the fact that one of the greatest drawbacks to the safe and economic working of our collieries and mines is the absence of a sufficient number of superior and properly educated officers. This has frequently been insisted upon by the Government Inspectors, and, truth to say, they have sufficient reasons for so doing. Neither proprietors on the one hand, nor the working collier on the other, can ever feel too grateful for the legislative enactment which rendered it imperative that managers should be duly certificated—that was a gigantic stride in the right direction; but we all know that often the management of the mine is left to underlookers, who, however competent to efficiently discharge their own duties, are far from being able to carry out regulations which properly belong to managers. We are quite aware that, as a rule, proper persons are engaged in all collieries to view and to first inspect for gas all workings before operations are resumed; but what we contend is that there should be a proper number of young men of education and promise engaged in the pit who would see the injunctions of the managers duly carried out, who would fearlessly report any flagrant breach of rules, and who are able to cope with any emergency which may arise in the absence of the general manager. No amount of Government inspection, nor the most careful supervision and working on the part of managers, will altogether prevent accidents in a calling which is beset with so many dangers; but an increased number of persons of acknowledged ability and foresight would materially lessen those fatal accidents which so largely swell the annual lists of deaths in mines, which after all are the greatest dread of the miner. Instances have lately been made public where there was a want of these properly qualified officers, and where, had they been entrusted with authority, would probably have prevented accidents, which, regarded in the very lowest light—the mere pounds, shillings, and pence view—would have been real economy to the proprietor. Everybody knows that it is a matter of daily occurrence that fatal accidents take place from falls of roof, for instance, from the working places not being properly spragged and propped, and when sprags and props are supplied in superabundance by the proprietor. The general manager, much less the Government Inspector, can never be responsible for such neglect as this, nor can any one man enforce the observance of the general rules in every detail in every part of the pit. Unfortunately the working collier is far too reckless of his own personal safety, and defies the observance of regulations which would render his working place comparatively safe. There should be a sufficient number of superior men or officers who should see that rules once given should be rigidly enforced and carried out, notwithstanding the collier may deem them unnecessary. As in every other avocation, one of the main elements of safety and success is the strict observance of duty and carrying out in their entirety all rules and regulations. This is especially the case in colliery operations, where neglect is fraught with such fearful consequences, and where the life of the miner is imperilled by non-observance of well-known rules.

There are several other points of detail in the working of our collieries which can scarcely be too often or seriously impressed upon owners or managers if they would avoid that ever-meddling policy by Government which is so prejudicial to their best interests. As a rule colliery proprietors are perfectly able to manage their own affairs, and they have due regard for the lives and safety of the miners; but it is obvious that the public are by no means satisfied with colliery management whenever a serious explosion occurs. Managers have it to a great extent in their own hands to diminish the number of fatal accidents by the enforcement of rules and regulations, the providing every means of safe working, the appointment of a sufficient number of officers to see the rules rigidly carried out, and recklessness on the part of the working collier reported and punished. The proprietors of our mines have no right—nor indeed do the great majority desire—to call upon the Government to do that which they can well do for themselves. We deprecate that frequent Government interference with our collieries which restricts operations and hampers trade, but in order to prevent this our proprietors and managers must show by their practical experience in management that they continue to exercise the necessary vigilance in their mines, and the rigid adherence to rules upon which the lives of the miner mainly depend. It is not in times of great public excitement, consequent upon some terrific explosion, that the more strict enforcement of rules should be sought, or the safety of our pits attended to, but by silently yet persistently inculcating upon our working collier the value and necessity of caution and prudence, the importance of carrying out in their strictest detail all rules and regulations, that he should endeavour to diminish that large number of "preventible accidents" which form the most formidable item in our yearly returns, and which are so many reflections upon our management. We may have the most adequate ventilation, we may have abundance of plant for spragging and propping, our winding and general safety appliances may be most complete, we may have the double-shaft system, and every requirement of Parliament in operation, but without due regard to rules and regulations on the part of the working collier, and proper officers to see them adhered to and carried out, shaft accidents, and those from falls of roof, will constantly occur. It is these the proprietor and manager should provide for and fight against, and it is these which we have most in our own power to prevent. There are times and seasons when attention should be called to the every-day details of our colliery operations, and in now doing so, when we are happily free from excitement, we would remind owners and managers that the best and most efficient way of relieving themselves of the many vexatious annoyances and interference on the part of the Government is to show that they are fully alive to their own interests, and have due regard to the welfare of their men.

THE CREDIT OF THE HOUR.

A clever Frenchman remarked some 20 years since that it was the despotism of the Pharaohs which had built the wonderful pyramids of Egypt, and the faith of the middle ages which had erected the splendid cathedrals of Strasburg and Rouen, but that it was credit which would pierce the obstinate Isthmus of Suez. The observation was not only epigrammatic, but what was still more important it was true. We who read the Frenchman's words have seen them realised. We have lived—at any rate, some of us have lived—to witness the piercing of the Suez Canal with the aid of the great modern magician—credit. Credit rules the nineteenth century commercial world, and the reason that that world is just now unmistakeably out of sorts is to be found in the fact that credit in most parts of the globe—and we must except the Australias from the remark—shows at present a prolonged weakness and languor. Credit put out its hand too far; credit burnt its fingers; and like a burnt child it now dreads the fire—that is, it shuns speculative enterprise even of a comparatively mild and innocuous type. Five years ago we were overdoing it with a vengeance. We were taking doubtful American railroad bonds by the hundred or by the thousand; we were lending to rotten South American Republics; we were founding semi-useless limited liability companies by the score. Not only was this the case with us in Great Britain but the Americans were also overdoing it with "premature" railroads and State and municipal bonds, of which it is not too much to say that many of them were only issued to defraud the victims who were weak and foolish enough to give good money for them. The Germans, again, on the close of their struggle with France in 1871 embarked in all kinds of doubtful undertakings, which landed them in such heavy losses that credit is at present almost as weak in Germany as it is in Great Britain and the United States. Then our Turkish and our Egyptian chickens came home to roost in 1875—in other words, we have sustained enormous losses in connection with investments so called in Turkish and Egyptian bonds. The Egyptian egg does not appear to be quite addled, and we may still derive some nourishment from it. Still Egyptian bonds have been a source of anxiety to their holders for many a weary month, and they have helped to increase the general weakness and feebleness of credit in Europe, and for the matter of that upon both sides of the Atlantic.

But even troubles bring with them some compensating advantages, and the rather dismal experience which we have acquired during the last two years has taught us some salutary lessons. If we have become poorer, we have at the same time grown more cautious, and caution is, of course, a virtue and a merit. If we have failed to keep the investment ball rolling as merrily—that is, as excitably and as vertiginously—as in 1871 and 1872, we have accumulated capital notwithstanding; and our savings have gone into securities of a sounder and more reliable type. Then the failure of credit appears to us to have assisted, after all, to maintain the peace of Europe. It is too much to suppose that Russia has lost her old ambition all at once, or that her vast standing army is to be demobilised for good and all. But Russian credit has grown weak, and Russian loans cannot in consequence be raised so easily as of yore. Russia is accordingly compelled, apparently, to adopt a policy of repose in this dull, stagnant 1877. Peace, at any rate, counts for something, and will help us to tide over the difficulties of the moment. Peace will also assist the return of that sound and legitimate enterprise for which all associated with our iron and coal trades are so earnestly longing.

TERRIFIC COLLIERY EXPLOSION NEAR SWANSEA—EIGHTEEN LIVES LOST.—About half past seven o'clock on Thursday morning last a terrific colliery explosion occurred in the New Worcester Colliery, the property of the Landore Siemens Steel Company, situate some three miles from Swansea, whereby 18 poor fellows suddenly lost their lives, and a large amount of property damaged. The day men went in for their turn between six and seven o'clock in the morning, and about half an hour after the resumption of work a terrific explosion was heard, not only throughout the whole of the workings of the pit but throughout the workings of the old pit, situate some 200 or 300 yards distant. The peculiar noise of these explosions is unfortunately too well known in this district to be mistaken, and in a very short time scores were seen hurrying to the pit's mouth, well assured that an explosion had occurred. As soon as the smoke and damp which issued from the down shaft had cleared away exploring parties heroically offered to descend, and were quickly organised into bands. On descending it was found that the "great slant" had been the scene of explosion, and there every one of the occupants, either 18 or 19 in number, were lying dead, suffocated either by the fire-damp or the equally fatal choke-damp. The bodies were quickly sent up the shaft, and were met by the anxious relatives and friends, and the scenes were of the most distressing and heart-rending character. Mr. Wales, the Government Inspector, was quickly on the spot, and at once descended, directing the movements of the exploring parties. Fortunately the force of the explosion was confined to the slant. Several medical men were soon on the spot, but their services were unfortunately of no avail. The pit is most efficiently ventilated by the fan system, and is exclusively worked with safety-lamps, and this is the first explosion which has occurred in the pit. The general manager is Mr. Thomas Glasbrook, one of the most able and experienced managers in South Wales. The cause of the catastrophe cannot be ascertained, if indeed it ever will be, as the overman and all who could give any account thereof have been killed.

EMPLOYMENT OF PAUPER BOYS IN COAL MINES.—An arrangement has been adopted, with only one dissentient, by the Stoke-on-Trent Board of Guardians, which will enable a large number of healthy and willing boys to earn a good livelihood in after life. Boys being required in the collieries about Dewsbury, masters have been found willing to employ them, and to sign an agreement guaranteeing them proper treatment both whilst at work and at other times. A boy who has worked in the pit a little time can earn 12s. per week, and gets 1s. per week more each year until he is 18 years old, when he becomes his own master, and receives man's wages. The boys work only eight hours a-day, and some of the guardians who visited Dewsbury to see how the boys already at work were getting on, found them well fed, well clothed, and looking very happy; they said they were well treated, and would not change their occupations on any account. The colliers with whom they worked appeared to be of a superior class, and a large number of boys in the workhouse are eager to go as soon as openings can be found for them. The only dissentient to the resolution was a Mr. Gilman, who had evidently never seen a mine, and, therefore, concluded that the result of working as colliers is "to get the skin worked off their backs and the hair torn off their heads," whilst as a matter of fact the deaths annually per 1000 employed is fewer among colliers than among any other class of workmen, the labour is not greater, and the pay higher.

THE COST OF COLLIERY ACCIDENTS.—At the annual meeting of the Lancashire and Cheshire Miners' Permanent Relief Society, held on Saturday, at Wigan, the Hon. and Rev. Canon Bridgeman presided. From the report of the board of management it appears that the society has now 65 local agencies, and the members number 22,977. The ordinary revenue for the year was 16,083*l.* 16s. 2d., of which 14,090*l.* 8s. 10d. was contributed by the men, and 1459*l.* 10s. 6d. by the masters. During 1876 there were 3913 cases of disablement amongst the members, 1618 receiving only one week's relief, and there were 56 fatal accidents, by which 61 members were killed. The fatal accidents placed on the funds 31 widows and 68 children, and at the close of the year 88 widows and 205 children were receiving annuities from the society. The cost of these had been 11,397*l.* 2s. 8d., made up as follows:—Surgeons, for medical attendance on accident cases, 3033*l.* 7s. 6d.; relief for disabled members, 5561*l.* 1s. 2d.; widows, 995*l.* 6s. 6d.; children, 1174*l.* 19s. 6d.; and on account of accidental death of members leaving no dependent relatives, 632*l.* 8s. The total expenditure had been 12,872*l.* 10s. 7d., and the available balance in hand now amounts to 13,828*l.*

COAL AND IRON IN THE UNITED STATES.—The aggregate production of anthracite coal in Pennsylvania to Feb. 19 this year amounted to 2,043,502 tons, against 1,975,922 tons in the corresponding period of 1875, showing an increase of 67,580 tons this year. The aggregate production of bituminous coal in Pennsylvania to Feb. 19 this year amounted to 280,621 tons, against 309,880 tons in the corresponding period of 1875, showing a decrease of 29,259 tons this year. Messrs. Clarke, Reeves, and Co., of Philadelphia, have secured orders for the construction of bridges in Canada, which will absorb fully 3000 tons of iron. The pig-iron trade is not considered to have improved at Philadelphia; where business is urgently solicited buyers expect, and in some instances obtain, concessions. Recent failures and troubles in the coal regions and a heavy decline in local railway securities have tended to depress the market. The bar iron trade has been quiet at Philadelphia. An improvement noted in steel rails at Philadelphia has been maintained, and sales have been advised of nearly 20,000 tons. These purchases have been made principally on account of New England railroads, and further transactions are reported to be pending. There is also a demand for steel rails from some of the Southern States. The demand for iron rails has been light at Philadelphia, and but little new business has been reported. There is, however, some enquiry for light rails.

TRADE OF THE TYNE AND WEAR.

March 7.—There is little change to notice in the state of the Coal and other trades here, and there certainly is no decided improvement to record. A fair business has been done in house and gas coals, and also in coke for shipment, but all other branches of the trade are as bad as possible. The notices of 30 miners employed at North Fenham Colliery have just expired, and they are now out of work. A number of men have also got notice at the Elswick and Thrickly Collieries. All the men at the Plashetts Colliery have got notice, which terminates at the end of the week. The Plashetts is part of a coal field in the North Tyne, 50 miles north-west of Newcastle. A serious dispute between the men and masters occurred some time ago at the Pegswood Colliery, near Morpeth. Mr. Gibson, the manager of the colliery, invented an apparatus for weighing the coals, and the men were offered work on condition that they were to be paid only on round coal produced. A few weeks ago a slight majority of the men were opposed to the proposed system, and, consequently, all of them received notice to quit. On Thursday last a vote was again taken upon the matter, which resulted in a majority of eight in favour of the system proposed by Mr. Gibson. The matter is now considered to be practically settled, and the men will continue to work under the new system. This system continues to make fair progress, and it will greatly benefit all concerned, both employers and workmen in the end. We do not know what the average result may be throughout the county, but at one large colliery it has been ascertained by the most careful experiments carried out over a considerable period that only 15 per cent. of small is now produced, whereas 35 per cent. of small was produced on the old system. The continual discharge of men and the stoppage of the works which has now been going on for some time, and is not likely to be discontinued at present, is entirely without precedent in this district. In 1845 there was a great depression and crisis in the coal trade, but it certainly was not equal in intensity to the present one. Upwards of 300 men employed at Evenwood, Cragwood, and Hunshwood Collieries are at present on strike. It appears that notice had been given of a reduction of 10 per cent., and also that the coals and lodging money will be stopped from the single men. The notice expired on Saturday, and the whole of the men have brought out their gear. It is understood that one of the pits, owing to the dulness in trade, was intended to be laid off.

Coal-Cutting by Machinery has not made much progress here. Three machines are, however, still working at Hetton—two Baird's machines and one Gillott and Copley's. There have been difficulties in the way, but they have persevered, and the machines are, on the whole, doing good work. This seam is exceptionally hard, and it would, of course, be very expensive to cut it by hand labour. All the machines are working well, but Baird's machines appear to be best adapted for working an extremely hard coal. As the majority of the seams in Durham are soft coals and labour is getting cheap there is no inducement to introduce machines for cutting them, but it is matter for surprise that the hard coals of Northumberland, where the seams are also thick, have not yet been worked by machines, as it is evident from the experience gained at Hetton that these seams can be worked much cheaper by machine than by hand labour. There are some hard coals in Durham besides those noticed at Hetton, and in one of these at Rainton, one of Earl Vane's collieries, one of Gillott and Copley's machines has been at work some time, and it is, we understand, doing good work.

Operations will be resumed at the Whitburn New Winning very shortly. Preparations are now making to get one of the engines in readiness to work the boring apparatus, for the system is nothing more than a huge boring tool or apparatus. The shaft has been sunk 25 fms., and the first operation that will be undertaken is the boring of a hole in the centre of this pit, 5 ft. in diameter, to a depth of 30 ft. below the present level. This is accomplished by a boring apparatus 5 ft. in diameter at the top, and pointed at the bottom; it, in fact, very much resembles a huge peg top. The apparatus is hollow in the centre, and the debris is removed by means of a "sludger" similar to the instrument commonly used by borers, but, of course, on a large scale. This is lowered down the centre at in-

servals, and the debris removed. The operations are, of course, carried out amongst water to any extent, indeed it is an advantage to have water. The boring is accomplished on the "free fall" system, invented, we believe, by M. Kind, a Frenchman, and first used by him with small rods. The borer is lifted a certain distance from the bottom by steam power, the connection is then cut off, and the borer falls and cuts away the rock at a speed varied according to its nature. The limestone rock at Whitburn is very hard, and the progress, therefore, will be comparatively slow, but much harder rock has been bored through in France, so that there is little doubt that the work will be accomplished. When the 5-ft. borer has been put down 30 ft. below the present level the larger borer will be introduced. This at the top will be 12 ft. in diameter, and this will finish the shaft. This process will go on until the shaft is put through the water-bearing strata; depth here 50 fms. from the present bottom, or 75 fms. from the surface, and then cast-iron tubbing will be put in. This tubbing is cast in the form of a ring the full size of the shaft, and 2 ft. in depth, and these rings are lowered down to the sound stone below the water feeders, and the shaft is filled up with those rings to a sufficient height above the origin of the water, or often up to the surface. When this is accomplished it only remains to pump the water out of the shaft, and afterwards the shaft can be sunk through the shales to the coal seams by the ordinary method if thought desirable.

At the Northern Institute of Mining and Mechanical Engineers' meeting, on Saturday, the chair was occupied by Mr. E. F. Boyd. The proceedings were extremely interesting, and the papers read of a most instructive character. The papers of Mr. Shaw and Mr. Page were of special interest, as the economical working of engines and boilers becomes every day of more serious consequence. The boiler described also has this strong recommendation—the consumption of fuel is so perfect that there is no smoke formed; this is very important, as the production of smoke in towns and on rivers is a great nuisance, and most users of steam are now compelled to adopt means to prevent the escape of smoke, and much extra expense is a matter of necessity in order to comply with the law on these points. The working of engines with a due regard to economy is no less important, as it is well known that many colliery engines belong to a type which consumes about four times the quantity of coal per horse-power per hour consumed by engines of improved construction. Mr. John Shaw read a paper "On a New Form of Marine Boiler." It stated that "no very great benefit will or can arise from increasing the working pressure at sea above from 60 to 75 lbs. or thereabouts, or if there is any advantage it will be chiefly in the possible reduction of weight and size, and not in any marked economy in fuel, while the disadvantages of extreme pressures are many and familiar to every marine engineer of experience. Thus the ordinary type of marine boiler still holds its own. It was claimed for the boiler which the paper described that it unites the advantage of the double-ended boiler with freedom from its defects. The boiler can be made either oval or cylindrical, or indeed rectangular. Two furnaces or fire tubes were shown in each boiler, but there may be any convenient number. The space formed between each pair of boilers receives the products of combustion from the fires of the two adjoining sections. According to one arrangement, this space is roofed by a fire-brick arch, whilst according to the arrangement shown in the plates it is covered by the projecting portions of the two boilers. In both cases the bottom of the space is formed of a plate of cast or wrought iron, usually lined with fire-brick, and its sides are similarly constructed. The cylindrical steam receiver communicates by a steam-pipe to shut-off valve with each boiler section. Thus any one of the sections can be thrown out of use at pleasure. The steam receiver can be placed either transversely over the fire-brick arch in the first arrangement, or it can be placed longitudinally between the crowns of the boilers. In either case it is mostly enclosed in a chamber communicating with the uptakes, so that it receives heat from the products of combustion on their way to the chimney, whereby the steam collected is kept hot and dried. The paper concluded as follows:—There now remains to state what has been the experience with this form of boiler at sea. Until now only one steamer has been fitted, and this is the Royal Dane, a vessel of 220 nominal horse-power, belonging to the Tyne Steam Shipping Company. She trades between Newcastle and Copenhagen, and is one of the fastest steamers sailing from the Tyne. She has now been running for about a year and a half, and her boilers continue to give unqualified satisfaction, nor is there the least symptom which might lead one to suppose that they will not last at least as long as any other form of marine boiler. The consumption of coal is so perfect that there is a total absence of smoke. Soon after starting an untoward accident happened to the starboard boiler, which gave an admirable opportunity for testing their very great accessibility for repairs. The side was removed, and the flame-box was thus left perfectly open and free for work and inspection. The last report received from the superintendent of the company, Mr. Moffatt, is perfectly satisfactory; and, though short, it is unequivocal, as follows:—"It gives me pleasure to inform you that the machinery of the screw steamer, Royal Dane, is now doing first-rate. The boilers keep beautifully clean, and give us no trouble, and yield ample steam; consumtion, within the promised standard; speed, 12 knots. I shall be glad to show the machinery to any of your friends and customers when convenient." A vote of thanks was given to Mr. Shaw for his paper, and also to Mr. William Page, who read a "Description of a Winding Engine provided with Variable Automatic Valve-Gear." The meeting also discussed the paper by Mr. Henry Hall and Mr. George Clarke, recently read, "On the Mechanical Effect of Blown-Out Shots on Ventilation."

NEWCASTLE INSTITUTE OF MINING AND MECHANICAL ENGINEERS.—The excursion of the members to Durham, Bear Park Colliery, Ushaw College, and Langley Park Colliery, on Wednesday, was largely attended; and when the trains arrived at Durham there were present upwards of 100 members, including Mr. T. W. Bunnig, Mr. G. B. Forster, Mr. Heppell Austin, Mr. G. May (Harton), Mr. Heccles (Boldon), Mr. Heppell (Wellington), Mr. A. G. Ross (Newcastle), Mr. Alex. Ross (Gateshead), Mr. Cockburn (Newcastle), Mr. Ramsay (Bladon), Mr. A. S. Palmer (Wardley), Mr. Cole (Bebside), &c. Bear Park Colliery is a new winning, the operations having been all conducted under the superintendence of Mr. G. B. Forster, of Backworth, the well-known mining engineer. It is situated three miles west of Durham city. In approaching the works the buildings have an imposing appearance, the tall engine-house and lofty chimneys have a fine effect; and as all the frame-work in which stands the pulleys for winding and the platforms for landing the coals are constructed of wrought-iron, it gives the place a light and pleasing appearance, in striking contrast to the old work to be seen in Durham, where heavy black timber framing gives the place a black and sombre appearance. But there is another feature which strikes the visitor at once, that is the almost entire absence of smoke; it is, indeed, difficult to conceive that the works are going, so clear is the atmosphere at and around the works. How this marvel is achieved will be shown shortly, and the great benefits derived therefrom. This is a coking coal colliery, the depth of the shaft to the Busty seam being 66 fms. The winding-engine is vertical, the diameter of the cylinder being 56 in., and length of stroke 7 ft. 6 in., and the diameter of the winding-drum 19 ft. The cage contains four tubs, containing upwards of 2 tons of coals, and two draws are made per minute, so that 240 tons are drawn per hour; and if the engine was supplied, upwards of 2000 tons of coals would be drawn in nine hours working. The coals are delivered into four revolving screens, and the small passed through those screens fall into rollers or crushers, which pulverise the coal and reduce it to dust, which then falls into small wagons; and when a train of these wagons are filled they are hauled away by small locomotives along a railway which passes over the tops of the coke ovens, and these ovens are charged direct from these wagons. There are 397 of these coke ovens at present. Two-thirds of the coal worked are consumed at these coke-ovens; and one-third, which is round coal, is sent by trucks for shipment. The thickness of the seam here is 4 ft., and the coal being soft the men produce on an average about 5 tons of coals each per day.

The colliery and coke ovens are in full working, and, as remarked above, there was an entire absence of smoke, which is effected in this way. A flue is carried over the top of the ovens, and the waste heat from them is conveyed by means of flues under eight boilers, each 60 ft. by 5 ft., and the steam is generated in those boilers, which supplies all the engines—that is, the large winding-engine already noticed; the pumping-engine (cylinder 36 in. 5 ft. stroke, diameter of pumps 18 in.); hauling engine, a pair of 12-in cylinders, and other smaller engines for working the revolving screens, brick-making apparatus, &c. The waste heat from the coke ovens is thus utilised, and the large quantity of coal generally consumed in generating steam entirely saved. The Langley Park Colliery is comparatively a young colliery, but the coke ovens are laid out in a similar manner to those already noticed at Bear Park, only the arrangements are not yet carried out to the full extent, but this will ultimately be done.

REPORT FROM MONMOUTHSHIRE AND SOUTH WALES.

March 8.—There is very little change to be noticed in the Iron Trade this week. Prices do not advance, although there is an enhanced activity prevailing at many of the ironworks in the district. On the other hand, those establishments which are still idle show no signs of re-starting, and this is due, no doubt, to the low prices which obtain. Clearances, have, however, been up to recent averages—in fact, rather more than usual—and orders are in hand for Brazil, the Cape, and the Peninsula; and the demand for miscellaneous descriptions is a trifle better again. The foreign demand for bars again shows a falling off, and clearances during the week have been very small. Pig-iron is materially unchanged at the steel-works; there is rather less business apparent. At the tin-plate establishments there is a better enquiry for best brands, but otherwise the trade is unaltered. Of the Coal Trade little can be said. The stormy weather has again impeded the movements of shipping. The Mediterranean ports absorb a considerable portion of shipments. The foreign demand for steam coal is good; but prices being so low, it is almost impossible to make a profit. As a consequence, several collieries have been stopped, or notices to terminate contracts been given. Many pits in the district are partially idle. For house coals the colder weather has caused an enhanced enquiry, but prices do not improve. Exports of patent fuel show an increase. The "Billy Fairplay" dispute is not yet settled, and although the proprietors have made terms with their men at Tredegar, the Mountain Ash men have taken out their tools.

The largest cargo of lead ore which has arrived at Llanelly for some time came to hand last week.

Notice to terminate contracts has been posted at the Sirhowy Works at the end of the present month. The men at the Briton Ferry Tinworks have resumed their employment at a 7½ per cent. reduction.

The South Wales Colliery Company general meeting did not pass off without some amount of unpleasantness. Col. Heyworth presided. The report showed a loss on the six months working of over 5000*l.*, and a total adverse loss of over 11,000*l.* The Chairman declined to move the adoption of the report, because he contended the statements contained therein were not an accurate record of the operations of the company. Mr. Kinnaird, one of the directors, proposed its adoption and said it was impossible to work with the Chairman, who is the managing director of the concern. The upshot of the matter was that Col. Heyworth resigned.

Mr. M. Llewellyn, manager of the Dunraven Collieries, has been presented by the workmen of the Blaenrhondda Colliery, where he had formerly been overman, with a gold watch and chain, an aneroid barometer and clock, a dial, and box of instruments, value 53*l.*, together with an address. Mr. Rowland Llewellyn presided. Addresses were delivered by Messrs. D. James, Enoch Mason, John James, G. M. Rees, Morgan Thomas, Daniel Roberts, Rev. H. Rosser, Rev. J. W. Maurice, Messrs. W. L. Armstrong (manager of the Blaenrhondda Colliery) and Howell Davies (manager of the Rhondda-Merthyr Colliery). The proceedings were enlivened with songs by Miss Sophia Davies, Messrs. D. Davies, D. Lloyd, Enoch Mason, and Jonah Williams.

REPORT FROM CORNWALL.

March 8.—By way of sett off to the tokens of encouragement to which we referred last week—or at least apparently so—some calculations have been made with regard to the quantity of black tin stocked at the present moment in connection with leading mines. This is estimated to amount to at least 1500 tons, worth at 40*l.* a ton 60,000*l.*, and representing a loss in interest on money advanced by bankers of some 3000*l.* a-year. This is, of course, a serious matter, especially in one or two individual cases, but it has to be borne in mind that a comparatively small advance would very soon recoup such a loss as this. It is not likely that those who have hoped against hope so long will give in now when the tide appears about to turn. It is important always to bear in mind that we are suffering from the effects of general depression still more than local. Now the American presidential difficulty is over trade there may be expected to revive. As to the Eastern Question, there is a growing feeling that that will be settled by effluxion of time, and by the Turkish Empire falling to pieces of its own accord.

But, whatever may be thought or said, these are admittedly very difficult times. Great Wheal Vor, after a most gallant struggle, has at length been compelled to succumb. Here is a mine of unknown age, and which has yielded almost untold wealth, obliged at length to give way to the pressure. Nor, if things do not mend speedily, can it stand alone. Another illustration of the difficulties at present attending tin mining is supplied by the struggle of Great Wheal Eleanor, a plucky attempt to revive the ancient mining industry of the north-eastern skirts of Dartmoor. Great Wheal Vor is a very old mine; Great Wheal Eleanor, save of the workings of the ancients, is a very young one, and each has had to fight its battle in its own peculiar way. Happily for the young concern, shallow as it is, no less an authority than Capt. Josiah Thomas is able to report that the lode most extensively worked upon is worth 33 lbs. of tin to the ton, and is capable of being profitably stoped. So Great Wheal Eleanor has a fair chance of holding on to better days.

Important experiments will shortly be made in connection with the working of our china-clay pits. Hitherto it has always been the custom to have the clay stopes broken up and exposed to the action of the running water, which carries the clay off in mechanical solution by manual labour. It has more than once been suggested that the principle of hydraulic mining—so well known, and so successfully worked in the gold workings of California and elsewhere—should be applied in this country. In America water is brought in artificial channels for scores—sometimes for hundreds—of miles, and discharged in jets under great pressure against the alluvial gold deposits; which, however hard and compact they may be, it never fails to thoroughly disentegrate and break up. Our china-clay stopes are by no means so difficult to deal with, and will not require such a head of water; and we have very little doubt that the experiments now in preparation are destined to revolutionise this most important department of china-clay production. There is, as a rule, plenty of water, and if it has to be pumped—as in many cases it would have to be—to the required level in most instances that is likely to be found an economical proceeding, as compared with the present mode of operation.

No more satisfactory proof of the position which the question as to the employment of boring machines in Cornish mines has taken since the successful trial of the Barrow borer at Dolcoath could be supplied than the tone of recent discussions. It is very sure indeed now that we have the applicability of boring machines to the conditions of mining as existant in the county questioned. There is still some controversy as to whether several may not be adapted beyond the four that have been proved, but now the chief concern is where the borers may be got, and whether the Barrow could not be manufactured in the county. No doubt this could very well be arranged. The Geach borer, which has done so well at Portskewet, has, we believe, been made at Hayle. It is really only a question of arrangement with the patentees and licensees, and if the local manufacture of these borers would tend to facilitate their introduction the sooner they are produced in the county the better. Everybody who knows anything about Cornish engine works and foundries knows that they are capable of turning out whatever engine works can do, and that their manipulatory and productive powers are limited only by the present limits of mechanical science.

A very curious and important case has come before the Stannaries Court in connection with Wheal Jane. On Saturday Mr. Marrack applied, on behalf of Capt. Smith, for an order to examine the books of Wheal Jane, under the clause of the Act of Parliament 18th and 19th Vic. c. 32, embodied in the rules of the Court, which empowered the Vice-Warden to call for the production of the books and papers for the inspection of any shareholder on application. Mr. Marrack stated that there had been a considerable difference between the statement of the late manager as to the capacity of the mine and the results reported by Capt. Southey. The one said it was impossible to return more than 10 tons per month, if as much; but Captain Southey stated at the last meeting that there had been broken, raised, and sold 62 tons of tin since he took the management, and that they had considerably more tinstuff and tin on surface than when he undertook the management. This statement was so antagonistic to that made by Capt. Giles that Capt. Smith, who, like Capt. Giles, lives on the sett, applied, as a shareholder, to inspect the books, with the view of satisfying himself that the work had been actually done. Capt. Southey refused Capt. Smith, and Capt. Smith then applied to Mr. Hocking, the purser, by writing. Mr. Hocking replied that he should be on the mine on the following Thursday, and that he would meet him there. Capt. Smith met Mr. Hocking and Capt. Southey on the mine on the day named, but they positively refused to allow him to inspect the books, on the alleged grounds that he was going to do the mine some harm. Knowing that every adventurer had a right to inspect the books and accounts at any reasonable time Captain Smith determined to apply to the Stannary Court to put the law in force; and, as neither Mr. Hocking nor Capt Southey appeared to show cause why the order should not be made, the Vice-Warden at once made the order, with costs.

The sequel of the Wheal Jane application came out to-day at the mine, when Capt. Southey and Mr. J. Hocking were in waiting to receive Capt. Smith on his visit of inspection. They charged Capt. Smith with an attempt to obtain a sight of the books by tampering with a clerk, which was the sole reason why inspection was refused. Hard words were freely bandied about, and Capt. Smith was informed that his conduct was mean and contemptible, and dictated by a wish to injure Wheal Jane, in the affairs of which, however, there was nothing to conceal.

The arrangement between the Great Western and the Cornwall Minerals Railways Companies, which we recently stated was in progress, has come to a definite and very satisfactory issue. The Great Western are to work the Cornwall Minerals line in perpetuity at their own percentage, guaranteeing to the latter a minimum receipt rising from 15,000*l.* to 18,000*l.*, and guaranteeing the debenture interest. The Great Western will also have the option of purchase within five years, on paying the debenture interest—4 per cent. on the preference and 2½ per cent. on the ordinary shares. The Cornwall Minerals lines are a valuable, and as yet little developed property.

REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

March 8.—At best, high-class bar firms can find only two-thirds time for the bulk of their hands, and there are some such firms who have very little work for either their bar or for their plate mills, yet 9*l.* and 9*l.* 12*s.* 6*d.* are still the quotations for the bars of such makers. Sheets are the most in demand at the second-class works, and girders and tank plates with nail-rods at the third-class mills. In the Dudley district sheets have slightly stiffened, through the reduction in the work doing at leading establishments thereabouts; but, taking South Staffordshire throughout, the quotations show a tendency to ease for all but A1 finished iron. Pigs are without movement, and the market is over supplied. Nevertheless best native qualities are strong in value. Coal is plentiful, both as to thick and also thin seam qualities, and house coal is in but little demand.

Joint-stock property does not strengthen in attractiveness either as to coal mining or iron-making concerns, nor are the recorded transactions of much importance. Spon Lane Colliery shares of 10*l.*, with 8*l.* 10*s.* paid, were sold on Monday at 5*l.* discount. West Cannock original shares are offered at 5*l.* discount and the new West Cannock shares at 2*l.* 10*s.* discount, whilst Cannock and Huntington, and also Hamstead Colliery shares, are offered both at 2*l.* discount, without sales. There are buyers of Sandwell Park at 20*l.*, and there have been sales at 20*l.* 10*s.*, but holders now ask 2*l.* in advance of that figure. Chillington Iron and Coal shares are to be had at 4*l.* 2*s.* 6*d.*, but buyers decline to advance upon 3*l.* 17*s.* 6*d.*

The Coalmasters Association of South Staffordshire and East Worcestershire resolved at a meeting last Friday to give the requisite six months notice to terminate the existing sliding scale agreement between themselves and their men. The object of the trade is to place itself in a position to get rid of the ruinous undertaking by which eight hours became a working day. What will actually result from the resolution will depend upon the condition of trade when at Michaelmas the notice expires. It should be no surprise that, so long as this arrangement lasts, colliery owners are desirous to keep down the other expenses incidental to the business relation between themselves and their men. There is a statement that one colliery company has taken steps to stop the supply of "allowance coal" to their men. At this the Unionist authorities have taken alarm, and, of course, have determined to "resist the encroachment." What it all means is that the company desire to give the colliers a money equivalent for the allowance coal.

A little impetus to one of the hardware branches has been given by the Indian Government having just distributed in South Staffordshire a good share of a considerable order for the class of road-making tools used by natives. The whole order comprises 60,000 tools.

North Staffordshire is unimproved upon the week. Competition is severe at the mills and forges by reason of the activity of the Warrington, the Middlesborough, and the Belgian firms, who in bars, in hoops, and in plates are selling at prices which North Staffordshire cannot always meet at a profit. The Coal Trade in North Staffordshire is disadvantaged by the continued dulness of the pottery branches.

The Bescot and Aldridge Patent Brick and Tile Company's first general meeting was held, on Wednesday, among those present being Messrs. R. Marriott (chairman), Wade, Hart, Allin, E. Tunstall, J. R. Gittings, R. Peckett, A. Southall, Harvey, Hargrove, Cunliffe, &c. The report stated that the Aldridge Works were in operation, and that the Bescot Works were nearing completion. The secretary stated that the demand for best blue bricks, &c., was very great, and that large orders were in hand.

In the High Court of Justice the hearing of the cause Bagnall *v.* Carlton has been commenced. The following is a brief indication of the nature of the proceedings. The plaintiffs are John Bagnall and Sons (Limited), a registered company established to buy from trustees for sale certain collieries and ironworks. The purchase-money was 290,000*l.*, and the bill alleges that under a secret contract the promoters received from the vendors, and therefore from the company, large sums of money; that the solicitors who conducted the sale participated in the alleged plunder; and that even two of the trustees for sale received a large pecuniary personal benefit. The bill seeks to set aside the contract, or, in the alternative, to make the promotors and other defendants account for their gains. Mr. Kay, Q.C., Mr. Fry, Q.C., and Mr. Russell Roberts appeared for the plaintiffs; Mr. Swanston, Q.C., and Mr. Ingle Joyce for Mr. Carlton, the first defendant on the record, one of the promoters; Sir Henry Jackson, Q.C., and Mr. Everitt for Mr. Albert Grant, another promoter; Mr. Hemming, Q.C., and Mr. Cozens Hardy; Mr. F. C. J. Millar; Mr. Westlake, Q.C.; Mr. C. T. Simpson; Mr. W. W. Karslake, and Mr. Woodroofe for other defendants.

SOUTH STAFFORDSHIRE AND EAST WORCESTERSHIRE INSTITUTE OF MINING ENGINEERS.—The quarterly meeting of members was

held last week,—Mr. Thomas Parton, F.G.S., in the chair. There were also present, among others, Mr. Peacock (vice president), Messrs. T. Latham (ex-president), J. W. Field, W. North, T. Bretrell, W. Spruce, J. Lawley, W. Blakemore, Alexander Smith (secretary), H. Johnson, sen., R. Evans, J. Broughall, &c. Mr. Walker, engineer, Birmingham, and Mr. Brown, Dudley, mechanical engineers, were elected ordinary members. The President explained that Mr. Henry Johnson, jun., was unable to read his paper on his Patent Colliery Wagon, in consequence of the March meeting following so close upon the annual one. Mr. Munro proposed that during the year scientific lecturers should be engaged by the council, the president, vice-president, and several others considering the suggestion an excellent one. Mr. Peacock also took occasion to thank the members for putting him into the office a second time, and suggested that papers on mines management would be the most valuable the Institute could receive. The motion of Mr. Munro was carried unanimously.

REPORT FROM THE FOREST OF DEAN.

March 8.—The Coal and Iron Trades of the district remain much as they were last week, being exceedingly dull. Notwithstanding the lowering the price of both coal and labour, many of the working colliers are making short time, in some instances only three or four days a week, and consequently the shipping trade is of a very limited and unsatisfactory nature. Many workers have left the Forest for other parts, and houses which three years ago could not be had, nor hardly sufficiently lodgings, are now both plentiful, notices "to let" being frequent in various directions. Yet, notwithstanding these sombre aspects of the district as to trade, labour, and population, the long-needed improvements are only now in course of construction. The Coleford Local Board has been engaged for some time in improving the sanitary character of the locality, much remaining yet to be effected, and is now laying on a service of water to the town; but, unfortunately, the contractor and the board have rather frequent jars and disputes, though it is hoped that all difficulties will be got over, and the work completed with satisfactory results. Perhaps the contractor has grounds for complaining that alterations are made in the amount of work to be done after the contract was agreed for, though it is only just on the other side to note that the board alleges in some instances that the contractor is scarcely up to his engagements. We just note the jars and disputes, but, of course, cannot pretend to say how far right or wrong the respective parties may be in the cases alluded to.

The sewage works at Cinderford being completed, excepting the connections with the houses, the sanitary authority has accepted tenders for the waterworks to be constructed. At the meeting on Tuesday at Westbury-on-Severn, when the said tenders were accepted, a discussion arose as to pumping water without steam machinery, Mr. J. A. Brain introducing the question, but the Inspector of Nuisances replied that the engineers well considered that matter at the time of their prospecting and survey, and were of opinion that self-acting plungers, water-wheels, or cheap methods proposed would work, and that steam power was a necessity. Mr. Carter said that the engineers employed were men of high character, and that they had acted on thier advice. Mr. Brain believed that the work could be done cheaper by rams, &c., but after the matter had been ventilated it was proposed and carried that the following estimates should be accepted:—For the engine and boilers (Watt and Co., Soho, Birmingham), 1090*l.*; for the general works (Messrs. Phillips and Co., London), 3797*l.*; iron pipes, &c. (Messrs. Lawrie and Co., London), 3001*l.*: total, 7888*l.*, the works to be completed in 10 months. Water is undoubtedly greatly needed at Cinderford and the surrounding vicinities, but at the same time the public works including sewage works, waterworks, and lastly the roads, will in the aggregate cost a heavy sum, and entail a heavy burden upon the rates, and coming during a time of unprecedented depression in the trade and labour markets will be unusually felt, which must be regretted, notwithstanding that the most enlightened of the district have long seen a necessity for amelioration in the outer and social aspects of the neighbourhood. Some there are who oppose all improvements on the ground of expense, and others by putting forth impracticable theories, but to wait for such to approach the possible would indefinately postpone all public improvements.

The whole of the interest in the collieries of the Park End and New Fowey Collieries Company has been acquired by Mr. J. W Sully, of Bridgwater, who has just purchased from the trustees of the late Mr. John Trotter two-fifths of the collieries named, which makes Mr. Sully the owner of the whole, having held three-fifths previously. The business will be carried on under the old style of Park End Coal Company, Mr. Sully's son, of Lydney, being trade manager, and Mr. J. S Thomas colliery manager.

REPORT FROM THE NORTH OF ENGLAND.

March 8.—There is no change to speak of in the North of England Coal Trade since last week, but changes of considerable importance seem to be impending. The Durham miners met in council to-day, and discussed the proposed reduction of wages, the proposed sliding scale, and the suggested lengthening of the hours of labour. Their proceedings were private, but on making enquiry to-day at Durham I was informed that they decided to take the necessary steps for bringing about a settlement of the proposed sliding scale, and so dispensing with the threatened further reduction of 10 per cent. Their proposals will be laid before a meeting of the owners to be held at Newcastle to-morrow, and thereafter a meeting of the joint committee of masters and men will take place, to consider what arrangements can be come to. It is anticipated that if the owners can only see their way to make a concession of 1d. or 1½d. in the minimum proposed under the sliding sale, that arrangement will be carried out without much difficulty. The Miners' Association is making a great effort to raise funds for the support of the unemployed in the county of Durham. Meetings have been held at different places throughout the county; and resolutions have been passed pledging the men to subscribe 2*l.* per week in aid of the unemployed, the number of whom continues to increase day by day.

A very interesting excursion was made by the North of England Institute of Mining and Mechanical Engineers to-day, to Bearpark and Langley Park Collieries, the former belonging to the Bearpark Coal Company, and the latter to the Consett Iron Company. It is considered by mining engineers that Bearpark is about the most perfect example of a well arranged and thoroughly efficient colliery in the county of Durham. Started some two or three years ago, with a capital of 208,000*l.*, the Bearpark Colliery has had the benefit of the personal superintendence of Mr. George Baker Forster, who has carried out the plans with a single eye to the utmost efficiency and economy. The company's royalty extends over 2000 acres, belonging to the Dean and Chapter of Durham. They are now raising about 700 tons of coal per week from the Busty seam, which is 4 ft. 6 in. thick, and found at a depth of 66 fms. They are, however, making arrangements for working the Brockwell seam, which lies at a considerably greater depth. The company have about 400 coke ovens, and some three-fourths of all the coal they produce is converted into coke. The waste heat from the coke ovens is utilised in raising heat for the boilers. The Langley Park Colliery is further up in the Lanchester valley, about five miles from the city of Durham, and, having only been commenced this year, is as yet in rather a crude state. The royalty is about 1400 acres, chiefly on the estate of the Earl of Durham. The company are now working the Harvey and Busty seams, all their produce of coal being coked. They reduce all the Busty coal to small by two of Carr's patent disintegrators, each capable of breaking up about 200 tons per day, and the screens they employ, on Walker and Cole's patent, are quite unlike anything to be found in the county except at Edmonsley and Wearmouth. The company work partly by a drift and partly by a shaft, the extreme depth at which the coal is found being about 56 fathoms. They have now 120 coke ovens, but propose to increase the number to about 300. After having seen these two collieries, and spent an hour at Ushaw College, the large party returned to Durham, where they broke up.

There is little improvement to note in regard to the export coal trade. From Newcastle there were shipped during last month to London and other ports in the kingdom 197,372 tons of coal, as compared with 221,074 tons last year, and from Sunderland the total quantity shipped the same month was 156,789 tons, as against 159,882 tons last year. In the foreign exports there is an equally great falling off, and altogether the prospects of the future are far from encouraging.

In the Cleveland ironstone mining district there is a very great deal of depression. Some additional pits have been placed on short time, and the majority are doing much less than they were a month or six weeks ago. The ironmasters have in some cases accumulated large stocks, which renders it improbable that there will be a renewal of activity among the ironstone mines for some time to come.

The returns of the Cleveland Ironmasters Association for the month of February show a large falling off in the production of pig-iron as compared with the preceding month, but not more than may be accounted for by the greater shortness of the month, while the stocks in makers' hands have increased to the extent of over 10,000 tons, and now stand at a total of nearly 180,000 tons. The tendency of prices is downwards, No. 3 having been quoted on Tuesday at the weekly iron market at about 44s. per ton, although some sales were effected at a still lower figure. Prices are exceedingly unremunerative, and it is generally expected that some of the 112 furnaces now in blast will require to be blown-out.

The creditors of Anthony Harris and Co. held a meeting at Middlesborough, on Saturday, when the statement of affairs showed liabilities to the extent of 40,173*l.*, as against 9261*l.* assets.

There is a slightly better tone in the Chemical Trade of the Tyne, but the engineering and shipbuilding trades rather dull. About the the finished iron trade there is nothing to say, the various departments remaining extremely quiescent. Prices are unchanged, and the prospects of the future are not considered encouraging.

A NFW ELECTRIC LAMP.*

This is a note communicated to the Acadamy by M. Denayrouze, in whose workshops the author has perfected the subject. The invention dispenses with all the mechanism usually employed in ordinary electric lamps. The new luminous source is formed by two carbon spindles fixed parallel at a small distance from each other, and separated by an insulating substance which disappears equally with the carbon. When the current commences to pass, the voltaic arc plays between the two free extremities of the two spindles. The nearest layers of insulating matter are volatilised in such a manner that the carbon and the insulating matter disappear progressively as combustion proceeds, a process which may be compared to the combustion of the wick and the wax of a candle respectively. This idea, which appears to be only a simplification, may lead to important results. The heat of combustion of the carbon, which with the ordinary regulators is lost in the air, is utilised in the fusion and volatilisation of the insulating material. The composition of the insulating material may be largely varied, but the author employs for the most part earthy materials. Substances ordinarilly the most infusible, it is well known, are easily volatilised when introduced into the voltaic arc. Therefore such insulating substances as sand, powdered glass, or cements, may be used; the most simple mixture appears to be composed of powdered glass and sand.

The light, which is added to that of the electric light by the incandescence of the insulating substance, produces effects analogous to that of the Drummond light. Thus with a given electro-motive force a greater light can be obtained than with any ordinary regulator. With a single electro-magnetic machine of the ordinary kind, three sources of light can be maintained.

— P. H.: Comptes rendus de l'Académie des Sciences.

* From JAMES FORREST'S "Abstracts of Papers in Foreign Transactions and Periodicals, for the Proceedings of the Institution of Civil Engineers."

JOTTINGS ON THE METALS—No. III.

By THOS. H. MILLER, Secretary of the Nascent Copper Company (Limited).

COPPER.

Kupfer (German), *Cuivre* (French), *Cuprum* (Latin).

ARSENIATE OF COPPER, of which there are two varieties.

1. *Octahedral.*—Colour: deep sky blue, sometimes Prussian blue, bluish white, apple green, and grass green.

How occurring, and general appearance.—It occurs in obtuse pyramidal octahedrons, the crystals being small, and aggregated into clusters, having a shining vitreous lustre, and are semi-transparent; in hardness being inferior to fluor spar. Fracture: lamellar. Specific gravity: 2·88.

2. *Foliated.*—Colour: olive, oil, and leek green.

How occurring, and general appearance.—It occurs rarely massive, and generally crystallised in acute rhomboids and oblique quadrilateral prisms, the surfaces smooth and shining. Internally it is glistening and shining with a diamond lustre. Translucent, passing into transparent, being somewhat harder than calcareous spar. Composition (according to Chevenix): oxide of copper, 54; arsenic acid, 30; water, 16 = 100.

Having thus roughly described the more important species of copper, and before passing to the reduction of the ores, I must apologise for the length of the article, in extenuation there of pleading a desire, on commencing, to describe a few of the varieties to complete the account in as satisfactory a manner as the works at my command would allow me, and, therefore, any inaccuracies that may be discovered in this simple sketch I hope my readers will excuse, and considering my want of the proper understanding of these matters will pass them over.

Copper ores, as a rule, are impregnated more or less with silver, and sometimes gold, in some cases in too small a quantity to be of actual benefit or gain to extract, and, therefore, are intimately combined in the metal when sold. In hydro-metallurgy, or the treatment of ores by the wet method, however, the rule is somewhat different, the whole of the metals being roasted with such ingredients that they become soluble in liquors to be precipitated either in one mass or the several metals separated by its proper precipitant. The amount of silver in copper ores varies so much that it is most difficult to give a perfect average, but I think we may, without fear, put it at ½ oz. per ton in the Spanish and Portuguese pyrites, 10 ozs. in the ores from the Cape and from some parts of America, and 5 ozs. in the copper ores of this country. Those from abroad are received at Swansea and elsewhere, ground to a certain size, and find immediate purchasers from the fact of their value in both copper and silver. Cornish ores being crushed to the same degree of fineness, and sold at sales about twice a month. I will now hasten on and give a rough idea of the several treatments of ore to enable the metal contained therein to be extracted and placed again in the market as saleable copper, commencing with the dry and finishing with the wet methods of treating.

The first reductions were performed by piling the ore in large kilns, and on heat being applied at the bottom the whole became gradually warmed, and a large portion of the arsenic and sulphur sublimed out, to be collected in proper chambers or allowed to escape. This process occupied about six months, at the expiration of which time the evaporation of the sulphur ceased, and when the ore was cooled sufficiently it was in a fit state to be smelted.

Later on we trace improvements in the calcination, by which the operation was performed in about 12 hours; this was done by placing the ore evenly, and about 6 in. in depth, on the floor of a reverberatory furnace, and exposed to a dull red heat, which with frequent stirring, in order to offer fresh surfaces to the action of the flame, the vapours were rapidly driven off, to be collected or allowed to escape as circumstances allowed, the metals being thereby oxidised and left as a black powder.

The present system is very similar, except in the case of arsenical copper ores, which are first piled in kilns and heat applied at the bottom, by increased warmth the volatile matters are expelled, to be received in a continuity of flues, and therein cooling are deposited in a dirty powder as arsenic soot; the ore being raked from the bottom of the furnace and a fresh supply placed in the upper part, thus once heating is sufficient to roast any quantity of ore, or, more properly speaking, until the kiln requires renovating. Notwithstanding the heat to which the ore has been subjected, it still contains a large percentage of sulphur and arsenic, to cleanse it from which as much as possible it is transferred to the reverberatory furnace, on removal from which it is presumed to be in proper condition for smelting.

The calcined ore is then conveyed to the flowing furnace, and a charge of about 2 tons placed evenly over the floor thereof, a little bruised limestone being sometimes added as a flux, all doors and air-holes are then plugged, and the heat raised as rapidly as possible, in fact, so much so, that after about five hours the interior of the furnace reaches a white heat. The doors are then opened, and the workman probes the fused contents to satisfy himself as to the thorough molten condition of the whole; if such is found to be really the case the slag is skimmed from the top of the metal, and a second charge of ore added, the doors being again closed and heat raised, to be followed by a repetition of the probing and skimming operations. The whole mass of metal that was contained in two charges of ore is then discharged in one steady stream into a large reservoir of water, which causes the settling of the copper in a granular form, in which state it is termed granulated coarse metal. The computation of the value of good metal in this condition is about 30 per cent. of copper, the residue consisting of iron and sulphur. To clean these grains from sulphur as much as possible they receive a 24 hours calcination at a bright red heat, great care being required that the whole does not go into a stats of fusion. About 4 tons are generally calcined at one time, the charge covering the floor of the furnace to about 4 in. in thickness. The next operation is fusing about 30 cwts. of calcined coarse metal, the silica and oxide of iron combining to form slag which is skimmed off, and the remainder tapped into sand moulds as *blue metal*, from its colour. There are certain arrangements and alterations in these operations which smelters have to study, and in which great proficiency is gained. I refer to the assortment and mixture of the ores of the different varieties and qualities by which the metal is recovered in a high condition of purity without more handling than is decidedly requisite. For instance, where oxides or carbonates are at hand they are mixed and fused with the calcined coarse metal, by which means great advantage is gained, for the oxide of iron in the latter fluxes the silica in the former, and the copper in the ore thereby formed into a sub-sulphuret, in which condition it is fit for smelting; the result of this fusion being a mat, termed *pimpled* metal, from the peculiar manner in which small beads form on the surface of the ingots, indicating the presence of sulphur. If no oxides or carbonates are at hand to mix, the blue metal before referred to instead of running into sand moulds is again dropped into water, and is ready for another calcination and fusion.

The next operation is roasting in furnaces similar to flowing furnaces, with the addition of side doors for charging, and more air-holes in the bridge. The charge, composed of about 3 tons, is placed in, and permitted to fuse; the air-holes are then opened, and the mass allowed to remain in a semi fluid state for a space of nearly 24 hours, and a slag is formed on the surface of the whole of the iron and sulphur, and is from time to time skimmed off. The proper effect of this roasting is a complete removal of all the impurities heretofore contained in the mat, and when that point is arrived at.

The operation of refining the metal, or bringing it into marketable operation, is performed by placing in a furnace with the floor inclining a little towards the front door, where a small cavity or well is made. The metal being fused, a slag again forms, which is raked off, and the whole kept in until such time as a ladleful of the metal being taken from the well and examined, sets with contraction; if favourable it is ready for the process of poling, which consists in throwing charcoal or anthracite coal on the metal to prevent oxidation, and the end of a pole of green wood (preferably birch or oak) forced to the bottom of the molten mass, violent ebullition takes place, during which any oxide or suboxide remaining is reduced. From repeated samples or assays taken the refiner is able to tell the progress making, which is done by hammering and examination on breaking. When the refining is brought to a proper pitch it is ladled into moulds of about 14 by 10 in., and constitutes the best selected copper of the market. Improvements have been made, some of which have been in use, but most of them not being successful, have gradually been abandoned in favour of the only, although may be primitive, method. As I before mentioned, admixtures of ores are made by the smelter, the principal point aimed at being that none shall be smelted containing less than 9 per cent. of copper, and also that the ores shall not contain such impurities which, notwithstanding repeated operations, may lessen the quality of the metal, and consequently reduce the value thereof in the market.

Having made a poor attempt to lay before my readers a scanty outline of copper smelting in the dry, I will now make a brief sketch of the processes that have been adopted to extract copper from its ores by the wet method. To begin with, we observe that in 1842 Mr. Wm. Longmaid patented an invention for improvements in treating ores and minerals, and in obtaining various products therefrom; this process consisted in grinding iron pyrites and roasting with common salt in a reverberatory furnace, the sodium in the salt combining with the sulphur to make sulphate of soda, and the copper being converted into a soluble cupreous chloride state. In lixiviation these salts were washed out and precipitated by lime or iron, and crystals of sulphate of soda forming. This process (or a modified form thereof) was in use for several years, and finally abandoned about 1860. In this same year (1860) Mr. William Longmaid filed a specification for improvements in treating certain ores and alloys, and obtaining products therefrom. His process does not differ much from the preceding, except that in some cases he submits the ore to a preliminary calcination for sulphur, and the employment of a condenser for the collection of weak hydrochloric acid, which can be advantageously used in the subsequent lixiviation.

In 1870 Mr. F. Claudet discovered a process of separating the precious from the base metals: this is performed in a similar manner, so far as roasting, grinding, and lixiviation is concerned, but to the resulting liquor weak hydrochloric acid is added to keep the copper in solution, and a fixed quantity of potassic iodide is passed in, which causes a bulky precipitate of silver in the form of iodide, which is collected, and found to consist of sulphate and chloride of lead, besides the silver, which on boiling with metallic zinc reduces the iodide of silver and sulphate and chloride of lead, forming iodide of zinc, this latter being used over again to precipitate a further quantity of silver.

In the Hunt and Douglass process, the ores being in a state of oxide or carbonate, are treated with chloride of iron, by which the copper is converted into a chloride and the iron into an insoluble oxide. Where ores are in a sulphide state a roasting is necessary to bring the same into an oxidised form, after which the ferrous chloride can be used with success. This process is satisfactory in its results at Ore Knob, in America, but as yet has not been introduced into this country.

The last method to which I shall draw attention is the Nascent process, and as it has been fully explained in my letter of Sept. 16, I will simply repeat what is therein stated with reference to the manipulation as performed at our works.

In the case of ores composed of copper, a little silver, arsenic, and tin, the whole is roasted to expel the arsenic, which on cooling is deposited in the flues, and eventually collected and disposed of as "arsenic soot;" when this is effected the ore is withdrawn from the furnace, intimately mixed with about 10 per cent. of salt and crushed to a fine state, in which condition it is ready for a further roasting in the chloridising furnaces. This second roasting has the effect of converting the copper and silver contained in the ore into chlorides, and for the purpose of extracting these the chloridised ore is removed to the precipitating house and placed in large tanks, and thoroughly lixiviated with hot brine, which has the property of dissolving chloride of silver, as well as the chloride of copper. The liquor is then run off into a second series of tanks, filled with scrap iron, which at once precipitates the copper in a metallic state, and this in its turn precipitates the silver, so that the resulting precipitate which falls to the bottom of the tank consists of metallic copper and silver, mixed with a little oxide of iron and other foreign substance. This, when collected and dried, is packed into bags and sold to the smelters. The ore from which the copper and silver have thus

en washed out is then stamped and dressed for tin in the usual anner. The precipitate usually contains 60 to 65 per cent. of copper, t the silver contents vary considerably, sometimes being as little 70 ozs., and sometimes 300 ozs. per ton.

In conclusion, I would beg to tender my thanks to those who ve taken the trouble to wade through this article, and hope to re abbreviated accounts of a few of the remaining metals, but fore doing so would draw attention to the expenses entailed in ducing ores by the dry method as compared with those of the wet, e being at least 30s. to 40s. per ton, the other from 12s. to 14s., tending to as much as 20s. in places difficult of access, or where terials fetch an extremely high price.

EXETER WATER COMPANY.

WANTED (immediately), an EXPERIENCED ENGINEMAN, to TAKE CHARGE (with another) of a CORNISH BEAM ENGINE and TWO WATER-WHEELS, at the Pumping Station belonging to the company, Pynes, near Exeter.
Wages, 23s per week, with house, coals, and candles.
For further particulars, apply to The Clerk, 4, Bedford Circus, Exeter, to whom applications are to be sent on or before Wednesday, the 14th instant.
Dated 3rd March, 1877.

WANTED, a FEW GENTLEMEN, who would employ their time and money by CONTRIBUTING not less than £500 each towards a SMALL CAPITAL necessary for WORKING SEVERAL RICH MINES OF HIGH PHOSPHATE OF LIME. The mines will be worked at a moderate royalty, and the quantity of mineral obtainable being large, promise to yield a very considerable profit. The capitalists will retain the money under their own control, and have the entire management in their own hands. Large contracts can be taken to supply these phosphates to the English market. No purchase-money nor any premium whatever required.
Letters to be addressed "Phosphate," at Hornc.stle's Central Advertisement Offices, 2, Queen street, E.C.

WANTED, an EXPERIENCED FOREMAN ENGINEER, accustomed to Mining Machinery, to TAKE CHARGE of WINDING and PUMPING ENGINES, PUMPS, LOCOMOTIVE ENGINES, BOILERS, FITTING and ERECTING SHOPS. Must be a good draughtsman. Wages to commence with £130 to £150 per annum, with house, coal, gas, and water.
Apply, enclosing references and testimonials, to W. B. TURNER, Esq., Mining Engineer, 23, King street, Whitehaven.

CARDIGANSHIRE.

WANTED, a PARTY to JOIN ADVERTISER in WORKING a REALLY VALUABLE LEAD AND COPPER MINE, in complete working order. There are now on surface from 10 to 15 tons of lead, besides a large quantity of copper and blende ready for dressing. This is no speculation, but a really sound investment, which will prod ce a splendid profit at once.
Address, "C. L. M.," MINING JOURNAL Office, 26, Fleet street, London, E.C.

WANTED, a YOUNG MAN, about 20 years of age. One who has had some experience in GENERAL UNDERGROUND COLLIERY WORK. Salary to commence with, £65 per annum.
Apply, by letter only, to THE CLIFTON AND KERSLEY COAL COMPANY, Clifton, near Manchester.
Copies only of testimonials to be sent.

WANTED TO SELL, a COAL MINE in SAXONY; a BED of BOG OCHRE in IRELAND; some PHOSPHATE MINES in SPAIN. WANTED TO BUY, FIVE HUNDRED TONS of FULLER'S EARTH, in lumps and ground.
Address, "C. L.," 925, Messrs. Deacon's, 154, Leadenhall street, E.C.

DESIRABLE INVESTMENT FOR CAPITAL.

WANTED, a FEW GENTLEMEN, to JOIN in the PURCHASE and WORKING of a PIECE of MINING GROUND in the RICHEST KNOWN DISTRICT in ENGLAND. £60,000 worth of mineral has been sold from surface, as deep as 40 fathoms. A steam engine of sufficient power is on the property, and pitwork all fixed ready to work. £1500 will be sufficient to purchase the sett, with its machinery, and sink the mine 20 fms. deeper, and open up a rich copper mine. It is proposed to divide it into 50 shares, at £30 each. Early application is necessary to secure it.
Apply for shares to Mr. CHAS. BAWDEN, Poldice House, St. Day, Scorrier, Cornwall.

PATELEY BRIDGE LEAD MINE.

WANTED TO PURCHASE, these SHARES, at £2 per share.—Address, "X. Y. Z.," MINING JOURNAL Office, 26, Fleet-street, E.C.

VAN CONSOLS MINE (LIMITED).

FOR SALE (cash), TWENTY to ONE HUNDRED SHARES. Middle quotation only. This property being down to the 85 fm. level (on a 40-foot lode), in lead worth over £80 per fathom, and continuous, must rival the Van.
Address, "Alma," Post Office, Bonchurch, Isle of Wight.

A CIVIL and MINING ENGINEER, of good practical experience, undertakes to MAKE SURVEYS, DESIGNS, PLANS, TRACINGS, &c., and SUPERINTEND WORKS in connection with the above profession. Terms moderate.
Testimonials and full particulars on application at 14, Blurton road, Clapton Park, London, E. Documents translated with the greatest accuracy from the French and German into English, and *vice versa*.

TO MINING COMPANIES.

A YOUNG MAN, at present holding the position of CLERK and DIALLER, will be shortly disengaged, and WANTS a SITUATION OF TRUST in a LARGE MINE or MINING OFFICE. Has been bred to Mining, and understands the practical part of the working of mines also. Highest references.
Address, "R. T.," MINING JOURNAL Office, 26, Fleet street, London, E.C.

W. F. LOWE, F.C.S.,
Associate of the Royal School of Mines,
ASSAYER AND ANALYTICAL CHEMIST.

ASSAYS AND ANALYSES MADE OF ORES, FIRE CLAYS, LIMESTONES, &c.

ADDRESS,—ASSAY OFFICE, CHESTER.

ADVERTISING.

C. H. MAY AND CO.,
GENERAL ADVERTISING OFFICES,
78, GRACECHURCH STREET, LONDON, E.C.
ESTABLISHED 1846.

ADVERTISEMENTS received for insertion in all NEWSPAPERS, &c.

TO MINERS IN NORTH AMERICA.

CHEMICAL LABORATORY AND GENERAL MINING OFFICES,

J. S. Phillips, M.E., San Francisco.

EXAMINER OF MINES, MINERAL ASSAYER, &c.
Practical Instructions for Testing and Assaying, by Blowpipe, Chemicals, Crucible, Scorifier, &c.
Author of the "Explorers', Miners', and Metallurgists' Companion," a practical work of 672 pages, with 81 illustrations. Price, second edition, $10·50.
Inventor of the "WEE PET" Assaying Machine, which obtained a GOLD MEDAL at the San Francisco Mechanics Institute Fair of 1869. Price $100.
Having had Thirty Years' experience (twenty in Cornwall and ten in U.S. America) offers his services to those requiring ADVICE on MINES or MINING, ENGINEERING, ASSAYING, SMELTING, MILLING, and CHEMICAL REDUCTION.
REFERENCES.
In England—The London *Mining Journal*, and leading Cornishmen.
In California—The *Mining and Scientific Press*, and principal Miners & Bankers

---

THE BIRMINGHAM WAGON COMPANY (LIMITED) MANUFACTURE RAILWAY WAGONS of EVERY DESCRIPTION, for HIRE and SALE, by immediate or deferred payments. They have also wagons for hire capable of carrying 6, 8, and 10 tons, part of which are constructed specially for shipping purposes. Wagons in working order maintained by contract.
EDMUND FOWLER, Managing Director.
WAGON WORKS,—SMETHWICK, BIRMINGHAM.
*** Loans received on Debenture; particulars on application.

In the Court of the Vice-Warden of the Stannaries.
Stannaries of Cornwall.

IN the MATTER of the COMPANIES ACTS, 1862 and 1867, and of the BOSCASWELL DOWNS TIN AND COPPER MINES ASSOCIATION (LIMITED).—ALL CREDITORS or CLAIMANTS of the above-named Association, claiming to be entitled to be paid in priority to the ordinary creditors thereof, and who have not received notice from the Official Liquidator thereof that their claims have been already admitted, are hereby required to COME IN and PROVE their SEVERAL DEBTS or CLAIMS, at the Registrar's Office, Truro, on Monday, the 19th day of March instant, at Eleven o'clock in the forenoon; or, in default thereof, they will be EXCLUDED from the BENEFIT of any DISTRIBUTION made before such proof. And for the purpose of such proof they are to attend in person, or by their solicitors or competent agents, at the time and place above mentioned. FREDERICK MARSHALL, Registrar.
Dated Registrar's Office, Truro, the 7th day of March, 1877.

MONDAY, TUESDAY, AND WEDNESDAY,
MARCH 12th, 13th, and 14th, 1877.
IMPORTANT SALE OF VALUABLE MINING PLANT AND MATERIALS,
At the CRENVER AND WHEAL ABRAHAM UNITED MINES,
in CROWAN, CORNWALL.

MR. W. J. JOHNS is instructed to SELL, BY AUCTION, on Monday, Tuesday, and Wednesday, the 12th, 13th, and 14th days of March next, at the CRENVER AND WHEAL ABRAHAM UNITED MINES, in the parish of CROWAN, in the county of CORNWALL, the whole of the valuable

MINING PLANT AND MATERIALS, thereon:—

Consisting of powerful PUNCHING MACHINE, screwing stock complete, 3 large double purchase winches, 8 arm capstan, about 20 tons rail iron, several tons of chain; large capstan ropes, about 1600 fms.; 3½ in. steel wire rope; 30 ft. water wheel, 3 ft. 4 in. breast; 11 ft. water wheel, 3 shears, shaft tackle, large and small pulleys and stands, several wood sheds, picking tables, jigging hutches and seives, large and small scales, about a ton of weights, several squares of flooring, buddles, keives, 2 large wood tin hutches, ladders, gratings, 6) lbs. lithofracteur, 5) lbs. tonite, &c.

1 10 ft. 18 in. windbore.
1 9 ft. 12 in. plunger pole.
2 9 ft. 15 in. pumps.
1 12 ft. 15 in. working.
1 10 ft. 15 in. windbore.
2 8 ft. 15 in. matching.
1 9 ft. 8 in. pump.
6 9 ft. 19 in. pump.
2 12 ft. 19 in. pump.
1 12 ft. 16 in. pump.
1 14 ft. 17 in. bucket working.
1 6 ft. 16 in. doorpiece.
1 6 ft. 18 in. doorpiece.
1 6 ft. 19 in. doorpiece.
1 6 ft. 18 in. windbore.
1 6 ft. 16 in. stuffing box.
2 1 ft. 16 in. matchings.
1 12 ft. 16 in. plunger pole, stuffing box and gland.
1 6 ft. 13 in. top doorpiece.
1 8 ft. 14 in. windbore.
1 1 ft. 13 in. matching.
1 1 ft. 11 in. matching.

IN MATERIAL HOUSE.—Smiths' bellows, indiarubber valves, butt, about 3 tons of steel borers, steel mallets and sledges, about 15 cwts. of brass bearings and valves, several tons of new and old ropes, lot of safety, several hundredweights of patent nails, new and old sheet lead, grease, oil, hilts, wire rope, old files, &c.

IN SMITH'S SHOP.—40 in. smiths' bellows, 6 anvils, 3 large cranes, vice, mandrils, tongs, punches and swedges, rod pins, kibble moulds and plates, bolt tools, several tons of new and useful iron, spanners, forge, cranes, &c.

IN FITTING SHOP.—Large crane with winch attached, several treble, double, and single iron blocks, boiler tester, vices, 3 lifting jacks, 1 hydraulic ditto, chains, bolts, burrs, &c.

IN CARPENTERS' SHOP.—About 100 ft. carpenters' benching, sawing tools, crowbars, cant hooks, lot of wheel and hand barrows, piece of 19 in. pitch pine, grinding stones and frames, Norway balk, useful timber, &c.

Also a wrought iron steam dry tube, 54 ft. by 3 ft. 6 in., miners' chests, &c.

Also an excellent weighbridge, by Huxham and Brown, calculated to weigh 10 tons, together with a small quantity of tin leavings, and a very large assortment of other materials and effects suitable for mining purposes.

The Auctioneer respectfully invites the particular attention of merchants, mine agents, and others to the above very valuable mining plant and materials, the whole of which was carefully selected at an enormous outlay, and will be found on inspection to be in good condition. The roads to the mines are convenient, and every facility is afforded by land carriage.

Sales to commence each day at Eleven o'clock.

For catalogues to view, and for further information, apply on the mines; or to Mr. ALFRED GOOD, New Poultry Chambers, 7, Poultry, London; or to the Auctioneer, Truro.

All the PUMPING, WHIM, and other ENGINES, BOILERS, CALCINER, PNEUMATIC STAMPS, CRUSHER, and other MACHINERY are to be DISPOSED OF by PRIVATE TREATY.

For particulars and price apply to the said Mr. GOOD, or to the Auctioneer.
Dated February 14th, 1877.

GLOUCESTERSHIRE, IN THE FOREST OF DEAN.

TWO VALUABLE GALES OR COLLIERIES, known as the RISING SUN ENGINE COLLIERY (freehold) and UNION COLLIERY (long leasehold), extending together over about 520 acres, and comprising several VALUABLE SEAMS of COAL, with good railway accommodation. The property is situate about three miles from Coleford and four from Lydney, traversed by the Bixlade and Dark Hill Valleys, and is on the Severn and Wye Railway, connecting Lydney on the Bristol Channel with Lydbrook on the Ross and Monmouth line, a branch of which line runs through the property. These collieries are well worthy the attention of coalowners and enterprising colliers, as shafts can be opened without any unusual expense, and with the certainty of finding coal, obviating the risk commonly attendant on the opening of new collieries.

MESSRS. DANIEL SMITH, SON, AND OAKLEY have received instructions to OFFER the above VALUABLE PROPERTIES FOR SALE, BY AUCTION, at the Mart, Tokenhouse-yard, E.C. (unless previously sold or let by private contract), on Wednesday, the 14th of March, in Two Lots.

Lot 1 will comprise the RISING SUN ENGINE COLLIERY (200 acres), and Lot 2 the UNION COLLIERY (330 acres). The vendors are prepared to negociate for the letting of these mines at improved royalties. The royalties payable are moderate, and the purchasers will be entitled to work a very large quantity of coal without payment in respect of the dead rent already paid.

Particulars and plans may be obtained of Messrs. GRAHAM and SONS, Solicitors, Abingdon, Berks; of Messrs. PRIOR, BIGG, CHURCH, and ADAMS, Solicitors, 61, Lincoln's Inn-fields, W.C.; at the Bell Hotel, Gloucester; at the Mart; and of the Auctioneers, 10, Waterloo place.

VALUABLE MINING PROPERTY FOR SALE.
PRELIMINARY ADVERTISEMENT.

THERE WILL BE SOLD, BY PUBLIC AUCTION, within the Chambers of the Liquidator, 115, Wellington-street, Glasgow, on Friday, the 22nd day of June, 1877, at Twelve o'clock noon, the PROPERTY of

THE CONCORDIA COPPER COMPANY,
IN LIQUIDATION,

As situated in Namaqualand, in the Colony of the Cape of Good Hope. The property consists of—(1). The Leases of about 380 acres of Land, containing Five Mines which have been partially worked and explored.—(2). The Buildings at the Mines, consisting of manager's residence, offices, blacksmiths' shops, stables, &c., and three ranges of buildings, containing workmen's houses, stores, &c.—(3). Machinery, consisting of horizontal Engine, water lift, pumping gear, &c.

The Liquidator is also PREPARED to SELL the office and house furniture, the stores of wood, iron, steel, rope, and mining utensils (the latter amounting as per inventory to about £2000), and the purchaser of the above will have the option of acquiring these at a valuation or otherwise, as may be arranged.

For further information, apply to JAMES MACROBBIE, Liquidator, 115, Wellington-street, Glasgow.

FOR SALE—PRICE £3000.

RED HEMATITE IRON ORE MINE—LIMESTONE FORMATION, near COAL MEASURES. The ore is identical in character with that produced in West Cumberland and North Lancashire, and there is (in South Staffordshire) a good market for it at net prices, equal to those realised for the ores of these districts. Payments easy to a good buyer.
Apply to Mr. J. FLETCHER-PAGEN, C. and M.E., Bodmin.

FOR SALE—PRICE £2500.

HEMATITE IRON ORE MINE—near railway and shipping port. Easy terms of payment to good buyer.

FOR SALE—PRICE £4000.

VALUABLE CHINA-CLAY AND FIRE-BRICK WORKS—Payments easy to a good buyer.

For particulars, apply to Mr. J. FLETCHER-PAGEN, C. and M.E., Bodmin.

SLATE QUARRY.

FOR SALE, a SLATE QUARRY, in NORTH WALES, in working order. The quality of the SLATE is GOOD, and the supply practically inexhaustible. Suitable either for private investment or for a company.
For full particulars, address, "Delta," MINING JOURNAL Office, 26, Fleet-street, London, E.C.

FOR SALE, or LEASE, GALVANISED IRON and STONE SHEDS, in SOUTH DOCK, SWANSEA, alongside Wharf and Rail, and suitable for Warehousing Metals, Minerals, Esparto, and other fibres, &c.
To view, apply to Mr. D. WILLIAMS, 36, Argyle-street, Swansea. For terms, to "A. B.," Messrs. Pottle and Son, Royal Exchange Buildings, London, E.C.

IRON ORE ROYALTY IN CUMBERLAND TO BE LET.

TO BE LET, BY TENDER, for a term of years, the ROYALTIES of IRON ORE under 42 acres or thereabouts of FREEHOLD LAND at Todholes, Cleator Moor, and under 11 acres or thereabouts at Cowriddings Egremont, both in the county of Cumberland.

These royalties are situated in the immediate neighbourhood of some of the most productive mines in the Cleator district, and within a short distance from the Whitehaven, Cleator, and Egremont Railway.

A considerable quantity of ore has been raised from the Todholes royalty, of which only a small portion has been proved.

Tenders for each royalty will be received up to 23rd March by Messrs. LUMB and HOWSON, and Mr. J. R. MUSGRAVE, Solicitors, Whitehaven, from whom further information may be had.—Whitehaven, 28th February, 1877.

HEAVY SPAR (BARYTES) FOR SALE.—Samples forwarded on application to—
MR. GEO. KING PATTEN, Secretary.
Llan Gan Mining Company, 47, Ann-street, Birmingham.

SULPHATE OF BARYTES FOR SALE.—Fine powdered, beautifully white; also in the Rock or Crude State, free from Lime and Metallic Oxide.
Samples on application to—
RUTHWAITE BARYTES MINING COMPANY,
Nov. 17, 1875. WHITEHAVEN.

MINING PROPERTIES FOR SALE.—SEVERAL bonâ fide BROWN HEMATITE, MANGANIFEROUS IRON, and SILVER LEAD MINES, situated in the Province of MURCIA, SPAIN, TO BE SOLD.
Apply to Sr. D. JOSE BOWYON, Del Comercio, Cartagena.

FOR SALE, at NEW PEMBROKE MINE, near PAR STATION, CORNWALL,
An excellent 80 in. cylinder PUMPING ENGINE, 12 ft. stroke in cylinder and 10 ft. in shaft, with cast-iron balance bob, and FOUR 12 ton BOILERS, in good condition.
ONE 25 in. DRAWING ENGINE, and TWO BOILERS.
ONE 20 in. STAMPING ENGINE, with three iron stamps' axles, carrying 32 heads, and TWO BOILERS.
Also, OTHER GOOD MINE MATERIALS.
Apply to—
MR. JOHN POLKINGHORNE, PAR OFFICE, PAR STATION.

ON SALE:—
ONE 70 in. cylinder single acting PUMPING ENGINE.
ONE 30 in. ditto ditto
ONE 22 in. WINDING ENGINE.
ONE 18 nominal horse power PORTABLE ENGINE.
Several CORNISH BOILERS, PITWORK, STRAPPING PLATES, CAPS, &c., and various other spare MINE MATERIAL. Also, one large BALANCE BOB.
Apply to—
WILLIAM TREGAY, REDRUTH, CORNWALL.

FOR SALE, a 18-horse power PORTABLE STEAM ENGINE, with link motion reversing gear, ready for delivery.
A 25-horse power PORTABLE.
An 18 horse power VERTICAL STEAM ENGINE, with nk motion reversing gear, also gear to wind and pump.
A 9-ft. PAN MORTAR MILL, VERTICAL ENGINE, and BOILER.
Apply to—
BARROWS AND STEWART, ENGINEERS, BANBURY.

ON SALE, TWO CORNISH BOILERS, 30 ft. by 7 ft. diameter Two flues through each. Safe at 60 lbs. pressure working.
Apply to HENRY PARKINSON, Foundry-street, Bolton.

ON SALE, ONE PAIR of 18 in. high-pressure HORIZONTAL ENGINES, for winding, fitted with slot link motion. First-class pair of engines.
Apply to HENRY PARKINSON, Foundry-street, Bolton.

ON SALE, ONE PAIR of 15 in. HORIZONTAL WINDING ENGINES, with slot link motion. Will be sold cheap.
Apply to HENRY PARKINSON, Foundry-street, Bolton.

ON SALE, ONE 25-horse power double cylinder PORTABLE ENGINE, fitted with slot link motion for winding.
ONE 20-horse power double cylinder PORTABLE ENGINE.
Will be sold cheap, and are in first-class order.
Apply to HENRY PARKINSON, Foundry-street Boiler Works, Bolton, Lancashire

---

ON SALE, ONE 8-horse power PORTABLE ENGINE, fitted up with winding drum; slot link motion; made by Clayton and Shuttleworth. Price £130.
Apply to HENRY PARKINSON, Foundry-street, Bolton.

ON SALE, ONE PAIR of 25 inch. coupled HORIZONTAL WINDING ENGINES, with drums and brake gear. Also ONE PAIR of 22 in. ditto. Will be sold cheap.
Apply to H. PARKINSON, Foundry-street, Bolton.

ON SALE, ONE strong well-built condensing BEAM ENGINE, by a first class maker, equal to new; cylinder 36 in. bore, 5 ft. stroke. Can be seen standing, and will be sold cheap. ONE close-built self-contained condensing BEAM ENGINE, stands on independent bed on six columns; cylinder 28 in. bore, 4 ft. stroke. As good as new. Can be seen standing, and will be sold cheap.
Apply to HENRY PARKINSON, Foundry-street, Bolton.

BOILERS ON SALE.—FOUR GALLOWAY'S PATENT BOILERS, 30 ft. by 7 ft., safe to work at 70 lbs. on the square inch.
TWO BOILERS, 28 ft. by 7 ft., with two flues through.
TWO BOILERS, 26 ft. by 7 ft., two flues through.
ONE BOILER, 20 ft. by 7 ft., two flues through.
ONE BOILER, 18 ft. by 6 ft., one flue through.
Also several smaller sizes.
Apply to HENRY PARKINSON, Foundry-street, Bolton.

ON SALE, ONE 16 horse power double cylinder PORTABLE ENGINE, for winding.
ONE 12 horse power PORTABLE ENGINE.
ONE 10 horse power PORTABLE ENGINE.
ONE 8 horse power PORTABLE ENGINE.
ONE 6 horse power PORTABLE ENGINE.
Equal to new, and will be sold cheap.
Apply to HENRY PARKINSON, Foundry-street, Bolton.

ON SALE, ONE PAIR of 25 in. horizontal WINDING ENGINES
ONE PAIR of 18 in. horizontal WINDING ENGINES.
ONE PAIR of 16 in. horizontal WINDING ENGINES.
ONE PAIR of 15 in. horizontal WINDING ENGINES.
ONE PAIR of 12 in. horizontal WINDING ENGINES.
ONE PAIR of 10 in. horizontal WINDING ENGINES.
ONE PAIR of 7 in horizontal WINDING ENGINES.
The above engines are now ready for delivery, and fitted with winding drum and brake gear to each pair of engines.
Apply to HENRY PARKINSON, Foundry-street, Bolton.

Price Two Shillings.

A FEW NOTES ON THE PORTABLE STEAM ENGINE; WITH AN ACCOUNT OF ITS CONSTRUCTION AND GENERAL ADAPTATION.
By JOHN HEAD, As oc. Inst. C.E.
Published by E. and F. N. SPON, 48, Charing Cross, London.

THE FOURTH EDITION OF MITCHELL'S ASSAYING.
In One Vol., 8vo., with 199 woodcuts, price 31s. 6d.,

A MANUAL OF PRACTICAL ASSAYING.
By JOHN MITCHELL, F.C.S.

Fourth edition, in which are incorporated all the recent valuable improvements in Assaying made in this country and abroad; including Volumetric and Colorimetric Assays, and the Blowpipe Assays. Edited and for the most part re-written
By WILLIAM CROOKS, F.R.S., &c.

"The fourth edition of Mitchell's well-known work is calculated to add to Mr. Crookes's high reputation as an analytical chemist. The work, as it now stands, may safely be taken as a guide by buyers of ores, by assayers, and by all persons engaged in the industry of chemical manufacture."—*Mining Journal.*

London: LONGMANS and Co.

SEVENTH EDITION, BY ROBERT HUNT, F.R.S.
In Three Volumes, medium 8vo., with above 2000 Woodcuts, price £5 5s. cloth; or £6 6s. half-bound in russia,

URE'S DICTIONARY OF ARTS, MANUFACTURES, AND MINES,
Containing a Clear Exposition of their Principles and Practice. Seventh edition, re-written and enlarged.
Edited by ROBERT HUNT, F.R.S.,
Keeper of Mining Records.
Assisted by numerous Contributories eminent in Science and familiar with Manufactures.

"The great point in a Dictionary like Dr. Ure's is to include all that is really essential without rendering the result too bulky, and consequently too costly. This end, we think, the Editor and his staff of eminent Contributors have reached to a very satisfactory degree. The Seventh Edition is a book which no manufacturer, merchant, miner, or technologist should be without."—*Quarterly Journal of Science.*

*** VOL. IV. SUPPLEMENTARY, completing all the Departments of the Dictionary to the beginning of the present year, will be published in the Autumn.

London: LONGMANS and Co.

MR. J. S. MERRY,
ASSAYER AND ANALYTICAL CHEMIST,
SWANSEA.

MR. R. TREDINNICK is a BUYER of Turkish, Egyptian, Russian, and Spanish Bonds, London and Westminster, London and County, and other Bank and Mining Shares. Dealers in Government, Industrial, and Miscellaneous Securities. Financial agency investors confidently advised by appointment.
A selected List of Securities given gratuitously to investors upon application by post.—31, Bishopsgate street Within, London, E.C.

B. & S. MASSEY, OPENSHAW, MANCHESTER.

Prize Medals—Paris, 1867; Havre, 1868; Highland Society, 1870; Liverpool, 1871; Moscow, 1872; Vienna, 1873; Scientific Industry Society, 1875; Leeds, 1875; Paris, 1875; Mancheser and Liverpool Society, 1876; U.S. Centennial, Philadelphia, 1876.

PATENTEES AND MAKERS OF DOUBLE AND SINGLE-ACTING

STEAM HAMMERS

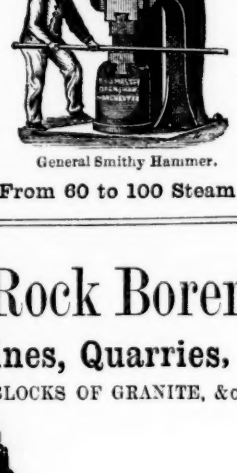
Of all sizes, from ½ cwt. to **20 tons,** with self-acting or hand motion, in either case giving a perfectly **DEAD BLOW,** while the former may be worked by hand when desired. **Large Hammers,** with **Improved Framing,** in **Cast** or **Wrought Iron. Small Hammers,** working up to 500 blows per minute, in some cases being **worked by the Foot** of the Smith, and not requiring any separate Driver.

SPECIAL STEAM STAMPS, for Forging, Stamping, Punching, Bolt making, &c.

CIRCULAR SAWS for Hot Iron.

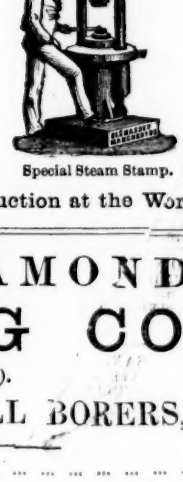
STEAM HAMMERS for Engineers, Machinists, Shipbuilders, Steel Tilters, Millwrights, Coppersmiths, Railway Carriage and Wagon Builders, Colliery Proprietors, Ship Smiths, Bolt Makers, Cutlers, File Makers, Spindle and Flyer Makers, Spade Makers, Locomotive and other Wheel Makers, &c., also for Use in Repairing Smithies of Mills and Works of all kinds; for straightening Bars, bending Cranks breaking Pig-iron, &c.

Smal Hammer with Foot Motion.

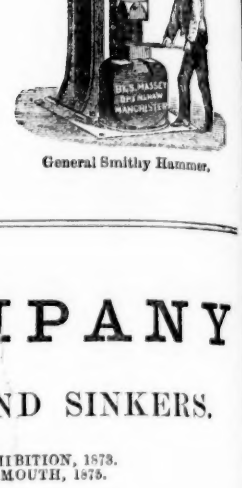


General Smithy Hammer.

Steam Hammer for Heavy Forging.



Special Steam Stamp.



General Smithy Hammer.

From 60 to 100 Steam Hammers and Steam Stamps may usually be seen in construction at the Works.

THE

"Champion" Rock Borer,

For Tunnels, Mines, Quarries,

HARBOUR WORKS, CUTTING BLOCKS OF GRANITE, &c.

STANDS POSITIVELY UNRIVALLED FOR

1.—EFFICIENCY.	5.—ADJUSTABILITY.
2.—ECONOMY.	6.—PORTABILITY.
3.—SIMPLICITY.	7.—COMPACTNESS.
4.—DURABILITY.	8.—STRENGTH.

Intending purchasers can satisfy themselves by personally inspecting "CHAMPION" Rock Borers at work in London, or where they are in actual operation, that the advantages claimed are not over-estimated.

AIR COMPRESSING MACHINERY

of the SIMPLEST and BEST CONSTRUCTION.

COMBINED AIR-COMPRESSORS

AND

WATER-PRESSURE ENGINES

Giving most excellent results.

ULLATHORNE AND CO.,

Mechanical and Consulting Engineers,

63, QUEEN VICTORIA STREET, LONDON, E.C

Now ready, price 3s., by post 3s. 2d., Sixth Edition; Twentieth Thousand Copies much improved, and enlarged to nearly 300 pages.

HOPTON'S CONVERSATIONS ON MINES, between Father and Son. The additions to the work are near 80 pages of useful information, principally questions and answers, with a view to assist applicants intending to pass an examination as mine managers, together with tables, rules of measurement, and other information on the moving and propelling power of ventilation, a subject which has caused so much controversy.

The following few testimonials, out of hundreds in Mr. Hopton's possession, speak to the value of the work:—

"The book cannot fail to be well received by all connected with collieries."—*Mining Journal.*

"Its contents are really valuable to the miners of this country."—*Miners' Conference.*

"Such a work, well understood by miners, would do more to prevent colliery accidents than an army of inspectors."—*Colliery Guardian.*

London: MINING JOURNAL Office, 26, Fleet-street; and to be had of all book sellers.

THE IRON AND COAL TRADES' REVIEW,
ROYAL EXCHANGE, MIDDLESBOROUGH.

The IRON AND COAL TRADES' REVIEW is extensively circulated amongst the Iron Producers, Manufacturers, and Consumers, Coalowners, &c., in all the iron and coal districts. It is, therefore, one of the leading organs for advertising every description of Iron Manufactures, Machinery, New Inventions, and all matters relating to the Iron, Coal, Hardware, Engineering, and Metal Trades in general.

Offices of the Review: London: 7, Westminster Chambers, S.W.; Middlesborough-on-Tees: Royal Exchange: Newcastle-on-Tyne: 50, Grey-street.

THE NEWCASTLE DAILY CHRONICLE
(ESTABLISHED 1764.)
THE DAILY CHRONICLE AND NORTHERN COUNTIES ADVERTISER
Offices, Westgate-road, Newcastle-upon-Tyne; 50, Howard stree North Shields; 195 High-street, Sunderland.

THE DIAMOND ROCK BORING COMPANY

(LIMITED).

CONTRACTORS, ARTESIAN WELL BORERS, AND SINKERS.

GOLD MEDAL FOR ROCK BORING MACHINERY ... EXHIBITION, 1873.
SILVER MEDAL " " ... FALMOUTH, 1875.

This company now undertake the sinking of Artesian Wells. Their system rivals all others, both for efficiency and speed, and in addition produces "Solid Cores" from the Rocks bored through, thus giving invaluable evidence of the strata passed through as the work progresses.—Vide *Brewers' Journal*, October, 1876, and other papers.

OFFICES,—2, WESTMINSTER CHAMBERS, LONDON, S.W.

THE "CRANSTON" ROCK DRILL

SUITABLE FOR

QUARRYING, SINKING SHAFTS, SUBMARINE BLASTING, TUNNELLING, DRIVING ADITS,

Is the MOST SIMPLE and ECONOMICAL DRILL now in use.

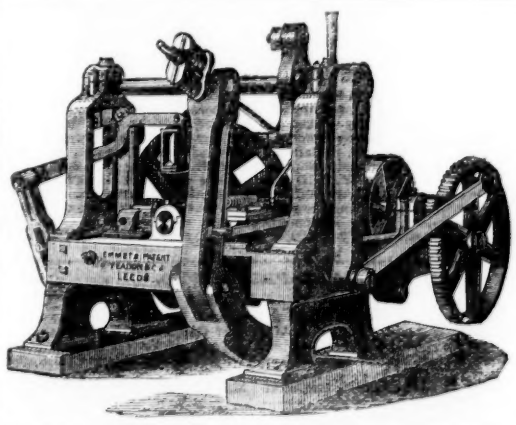
BOILERS; AIR COMPRESSORS, worked by Hydraulic or Steam-power; STEEL for MINING DRILLS; PUMPING, and all other MINING MACHINERY supplied.

For Prices, Estimates, and other Particulars, apply to—

J. G. CRANSTON, 22, GREY STREET,

NEWCASTLE-ON-TYNE.

Mr. TAIT, Manager, East Hetton Quarry Company's Works, Coxhoe, Durham, writing on May 12, 1876, says—"I have pleasure in testifying to the value of your Rock Drills. The two you supplied us with about six months ago are giving us entire satisfaction. The cost of drilling by machine is less THAN ONE-FOURTH THAT OF DRILLING BY HAND. By the use of the Drills we have been able very greatly to increase the out-put of stone without increasing the number of men employed."



EMMET'S

A1 PATENT BRICK MACHINE.

Massive; durable; cheap; takes little power, and gives PERFECT SATISFACTION.

This is the ONLY Machine which presses the Brick equally on BOTH sides, each plunger entering the mould plate ⅝ in., and turning out 12,000 SQUARE, SOLID, PRESSED Bricks per day, READY AT ONCE FOR THE KILN.

SOLE MAKERS—

YEADON AND CO.,

CROWN POINT FOUNDRY, LEEDS.

Makers of EVERY DESCRIPTION of Colliery and Brick Yard Plant.

LONDON AGENTS—
HAUGHTON AND CO., No. 122, CANNON STREET, E.C.
CONTINENTAL AGENTS—
PLAMBECK AND DARKIN, 171, QUEEN VICTORIA ST., E.C.

MANCHESTER WIRE WORK.

NEAR VICTORIA STATION, MANCHESTER.

(ESTABLISHED 1790).

JOHN STANIAR AND CO.,

Manufacturers by STEAM POWER of all kinds of Wire Web, EXTRA TREBLE STRONG for

LEAD AND COPPER MINES.

Jigger Bottoms and Cylinder Covers woven ANY WIDTH, in Iron, Steel, Brass, or Copper.

EXTRA STRONG PERFORATED ZINC AND COPPER RIDDLES AND SIEVES.

Shipping Orders Executed with the Greatest Dispatch.

JEWELS, PLATE, AND VALUABLES

May be DEPOSITED for SAFE CUSTODY in the Fire and Burglar-proof Vaults of the

NATIONAL SAFE DEPOSIT COMPANY,

LIMITED.

Apply to H. WEST, Esq., Manager, 1, Queen Victoria-street, Mansion House.

THE MINING SHARE LIST.

BRITISH DIVIDEND MINES.

Shares.	Mines.	Paid.	Last wk.	Clos. pr.	Total divs.	Per sh.	Last pd.
1500	Alderley Edge, c, Cheshire*	10 0 0	—		12 11 8	0 5 0	Jan. 1876
15000	Balmynheer, t, Wendron (4000 to is.)	1 0 0	—		0 2 0	0 2 0	Nov. 1875
30000	Bampfylde, c, i, mn., Devon*	1 0 0	1⅝	1½ 1⅝	0 2 0	0 2 0	June 1873
200	Botallack, t, c, St. Just§	119 5 0	30	25 30	619 15 0	5 0 0	Aug. 1872
4000	Brookwood, c, Buckfastleigh	1 16 0	2½	2¼ 2½	3 16 0	0 2 0	Nov. 1875
2000	Bryn Alyn,* l, Denbigh. (10l. sh.)	8 0 0	8½	8 8½	0 7 0	0 7 0	Jan. 1877
5348	Cargoll, s-l, Newlyn§	6 6 0	5½	5½ 6	4 16 3	0 12 6	Oct. 1872
6400	Cashwell, l, Cumberland*	2 10 0	2½	2½	1 9 6	0 2 0	Aug. 1876
1000	Carn Brea, c, t, Illogan†§	36 0 0	37	35 37½	308 0 0	1 0 0	Feb. 1874
2450	Cook's Kitchen, t, Illogan†§	23 9 9	3½	2½ 3	11 17 0	0 7 6	Jan. 1873
10240	Devon Gt. Consols, c, Tavistock†*	1 0 0	4½	4 4½	116 10 0	0 12 0	May 1872
4296	Dolcoath, c, t, Camborne	10 14 10	37	35 37½	111 1 3	0 7 6	Jan. 1877
5000	East Black Craig,* l., Scotland	5 0 0	6¼	5¾ 6¼	0 10 0	0 10 0	Feb. 1877
6144	East Caradon, c, St. Cleer†	2 14 6	1¼	1 1½	14 19 0	0 2 0	Oct. 1872
300	East Darren, l, Cardiganshire	32 0 0	—		235 10 0	1 0 0	Aug. 1876
6400	East Pool, t, c, Illogan	0 9 9	11½	10 11	14 18 3	0 2 0	Dec. 1876
2800	Foxdale, l, Isle of Man*†	25 0 0	—		82 5 0	0 10 0	Feb. 1876
40000	Glasgow Cara., c* [30,000 £1 p., 10,000 15s. p.]		1¼	1 1¼	0 12 4	0 0 6	Mar. 1877
15000	Great Dyliffe,* l, Montgomeryshire	4 0 0	5	4 5	0 2 6	0 2 6	Apr. 1876
15000	Great Laxey, l, Isle of Man*	4 0 0	21	20½ 21½	21 3 0	0 10 0	Jan. 1877
615	Great Retallack, l, bl, Perranzabuloe	5 18 6	1½	1 1½	0 1 6	0 1 6	May 1876
25000	Great West Van, l, Cardigan*	2 0 0	½	⅜ ½	0 2 0	0 1 0	Aug. 1874
5908	Great Wheal Vor, t, c, Helston†§	41 12 6	¾	½ ¾	15 19 6	0 2 6	June 1872
6400	Green Hurth, l, Durham*	0 6 0	3	2¾ 3	1 12 0	0 4 0	Oct. 1874
20000	Grogwinion, l, Cardigan*	2 0 0	5¼ xd	4½ 5½	0 12 0	0 4 0	Feb. 1877
9830	Gunnislake (Clitters'), t, c	5 5 0	2⅝	2½ 2⅝	0 13 9	0 1 0	Oct. 1876
1024	Herodsfoot, l, near Liskeard†	8 10 0	2¾	2½ 2¾	62 5 0	0 15 0	Oct. 1872
18000	Hingston Down, c, Calstock*†	1 0 0	¾	⅜ ⅝	0 1 0	0 1 0	Nov. 1875
60000	Holmbush, a, c, s-l, Callington*	1 0 0	1⅜	1¼ 1⅜	0 1 0	0 0 6	Mar. 1877
25000	Killaloe, s, Tipperary	1 0 0	—		0 3 11½	0 0 6	Mar. 1873
400	Lisburne, l, Cardiganshire	18 15 0	80	70 80	579 10 0	1 0 0	Jan. 1877
14000	Llanidloes,* l, Montgomery	3 0 0	3	2 3	0 9 0	0 4 6	Nov. 1876
5120	Lovell, t, Wendron	0 16 0	—		0 17 6	0 1 6	Jan. 1874
9000	Marke Valley, c, Linkinhorne	5 0 6	1⅛	1 1¼	7 15 0	0 2 0	Jan. 1876
11000	Melindur Valley, l, Cardigan*	3 0 0	1½	1 1½	0 7 2	0 3 7	Jan. 1875
9000	Minera Mining Co., l, Wrexham*	5 0 0	21	19 21	66 16 2	0 8 0	Feb. 1877
20000	Mining Co. of Ireland, cl, c, l*	7 0 0	5½	5⅜ 5½	23 11 6	0 3 6	Jan. 1876
512	North Busy, c, Chacewater	3 9 6	8½	8 8½	0 10 0	0 10 0	Dec. 1875
10289	North Hendre, l, Wales	2 10 0	—		1 7 6	0 2 6	Dec. 1876
2000	North Levant, t, c, St. Just§	12 2 0	—		4 13 0	0 12 0	Sept. 1873
27855	Old Treburgett,* s-l, ordinary shares	1 0 0	—		0 0 9	0 0 9	Feb. 1874
9258	Old Treburgett,* s-l (10 per ct. pref.)	0 10 0	½	¼ ½	0 1 4½	0 0 6	July 1874
5000	Penhalls, t, St. Agnes	3 0 0	2¾	2½ 2¾	3 13 6	0 2 0	July 1875
45793	Penstruthal,* t, c, Gwennap	2 0 0	⅝	½ ⅝	0 2 8	0 0 8	Nov. 1875
12000	Phœnix, & W. Phœnix, t, c, Link.§	3 4 9	4½	4 4½	2 9 6	0 4 0	Nov. 1872
18000	Prince Patrick,* s-l, Holywell	1 0 0	2½	1¾ 2¼	0 14 0	0 1 3	Jan. 1876
1120	Providence, t, Lelant†§	18 6 7	2½	2 2½	104 12 6	0 10 0	Sept. 1872
12000	Roman Gravels, l, Salop*	7 10 0	14	13½ 14	7 1 6	0 6 6	Mar. 1877
512	South Caradon, c, St. Cleer	1 5 0	125	115 125	734 0 0	3 0 0	Jan. 1877
6123	South Condurrow, t, c, Camborne‡	6 5 6	6⅝	6½ 6¾	2 6 0	0 4 0	Jan. 1877
12000	St. Harmon,* l, Montgom.	3 0 0	3½	3 3½	0 3 0	0 3 0	Jan. 1877
10000	So. Pr. Patrick,* s-l. (8000 sh. issued)	1 0 0	—		0 7 0	0 1 0	Oct. 1875
12000	Tankerville, l, Salop*	6 0 0	8⅜	8¼ 9	4 17 0	0 5 0	Dec. 1876
6000	Tincroft, c, t, Pool, Illogan†	9 0 0	20	19 21	50 3 6	0 5 0	Mar. 1877
15000	Van, l, Llanidloes*	4 5 0	38	36 38	19 19 6	0 18 0	Dec. 1876
3000	W. Chiverton, l, Perranzabuloe†	12 10 0	19	18 19	55 0 0	0 10 0	Jan. 1877
1733	West Poldice, St. Day	10 0 0	13	11 13	1 19 0	0 4 0	July 1876
512	West Tolgus, c, Redruth	95 10 0	61	59 60	18 15 0	1 0 0	Feb. 1877
2048	West Wheal Frances, t, Illogan	27 13 9	5	4½ 5	3 12 6	0 5 0	Oct. 1872
12000	West Wye Valley,* l, Montgomery	3 0 0	3¾	3¼ 3¾	0 6 0	0 3 0	Nov. 1876
512	Wheal Basset, c, Illogan†§	17 2 6	9	7 9	638 10 0	1 10 0	Aug. 1872
1024	Wheal Eliza Consols t, St. Austell	20 0 0	—		10 0 0	4 0 0	Feb. 1876
2048	Wheal Jane, t, Kea	2 13 10	2	1½ 2	8 5 0	0 5 0	July 1875
4295	Wheal Kitty, t, St. Agnes	5 4 6	3¼	2½ 3	11 19 6	0 2 6	Dec. 1874
80	Wheal Owles, t, St. Just§	86 5 0	140	130 140	522 10 0	4 0 0	Aug. 1872
6000	Wheal Prussia, t, Redruth	2 0 0	4½	4¾ 4⅞	0 3 0	0 2 0	Dec. 1875
25000	Wicklow c, sul, t, Wicklow	2 10 0	2	1½ 2	52 9 0	0 2 6	Mar. 1872
10000	Wye Valley, l, Montgomery*	3 0 0	6	5 6	0 10 6	0 4 6	Oct. 1876

FOREIGN DIVIDEND MINES.

Shares.	Mines.	Paid.	Last wk.	Clos. pr.	Total divs.	Per sh.	Last pd.
35500	Alamillos, l, Spain*†	2 0 0	2½	2 2½	1 16 3	0 1 6	Oct. 1876
30000	Almada and Tirito Consol., s*†	1 0 0	½	¼ ½	0 6 3	0 1 0	May 1876
20000	Australian, c, South Australia†	7 7 6	2¾	1¾ 2¾	0 18 0	0 2 6	Aug. 1876
10000	Battle Mountain,* c, (6240 part pd.)	5 0 0	—		0 10 0	0 10 0	Nov. 1872
15000	Birdseye Creek, g, California*	4 0 0	⅞	¾ ⅞	0 14 0	0 2 6	June 1874
12320	Burra Burra,* c, So. Australia	5 0 0	—		70 0 0	0 10 0	Oct. 1872
20000	Cape Copper Mining,*† So. Africa	7 0 0	41	40 42	26 15 0	1 0 0	Dec. 1876
40000	Cedar Creek, g, California*	5 0 0	¾	⅝ ¾	0 5 0	0 2 6	June 1873
15000	Chicago, s, Utah*	10 0 0	5	4 4½	2 8 0	0 4 0	Nov. 1876
21000	Colorado Terrible, s-l, Colorado*†	5 0 0	2¼	1¾ 2¼	0 13 6	0 4 0	Jan. 1875
10000	Copiapo, c, Chili* (£20 shares)	16 15 0	—		7 8 5	0 2 6	Jan. 1876
100000	Don Pedro North del Rey*†	0 16 0	½	¼ ½	2 5 9	0 2 0	Mar. 1872
28500	Eberhardt and Aurora, s, Nevada*†	10 0 0	9	8½ 9	1 8 0	0 3 0	Dec. 1876
50000	Emma,* g, s, Utah	20 0 0	⅝	⅜ ⅝	3 12 0	0 6 0	Dec. 1872
70000	English and Australian, c† S. Aust.	2 10 0	1⅝	1⅜ 1⅝	2 18 9	0 2 0	Mar. 1876
30000	Flagstaff, s, Utah*	10 0 0	3¾	3 3½	4 2 0	0 5 0	July 1873
25000	Fortuna, l, Spain*†	2 0 0	7	6½ 7	6 2 6	0 6 8	Oct. 1876
55000	Frontino & Bolivia, g, New Gran.*†	2 0 0	1⅝	1⅜ 1⅝	0 1 0	0 1 0	June 1876
20000	Gold Run, hyd.	1 0 0	—		0 2 4	0 0 4	Oct. 1872
68000	Kapunda Mining Co. Australia†	1 3 0	—		0 2 4	0 0 6	June 1873
20000	Last Chance, s,* Utah	5 0 0	1	½ 1	0 14 0	0 2 0	July 1873
15000	Linares, l, Spain*†	3 0 0	7¼	6¾ 7¼	16 8 2	0 9 0	Oct. 1876
65000	London and California, g*†	2 0 0	⅝	⅜ ⅝	0 1 0	0 1 0	July 1875
7837	Lusitanian, Portugal*† (£5 shares)	3 10 0	—		1 11 6	0 1 6	Mar. 1873
5000	Mammoth Copperopolis of Utah, c, s	10 0 0	—		0 5 0	0 5 0	Dec. 1872
5000	Mountain Chief, s, Utah*	10 0 0	—		0 4 0	0 4 0	Jan. 1873
18000	Prussian Mining & Ironworks, cl, i.	30 0 0	—		6 0 0	3 0 0	July 1873
10000	Pontgibaud, s-l, France†	20 0 0	23	21 23	23 1 1	1 11 1	Nov. 1876
100000	Port Phillip, g, Clunes*†	1 0 0	¾	½ ¾	1 8 0	0 1 0	Jan. 1872
54000	Richmond Consols, s, Nevada*†	5 0 0	6¼	6¼ 6¾	3 9 0	0 7 6	Oct. 1876
40000	Santa Barbara,* g, Brazil	0 10 0	2⅝	2¼ 2½	0 2 6	0 1 3	Oct. 1876
120000	Scottish Australian Mining Co.*†	1 0 0	2	1¾ 2	17½ per cent.		Nov. 1876
80000	Scottish Austral. Mining Co., New	0 5 0	⅝	⅜ ⅝	17½ per cent.		Nov. 1876
112500	Sierra Buttes, g, California*†	2 0 0	1¾	1¼ 1¾	1 16 0	0 2 0	Oct. 1876
60000	South Aurora, s, Nevada*	5 0 0	⅜	¼ ½	0 14 2	0 2 0	Nov. 1873
£253000	St. John del Rey*† (£5 stock and multiples dealt in)			270 320	½ year	20 p. ct. for Dec.	1876
20000	Tolima, g, s* So. America	5 0 0	3¾	3 3¾	0 11 6	0 6 6	May 1874
25000	Victoria (London)*, g, Australia	1 0 0	1¼	1 1¼	0 11 10½	0 0 10	Aug. 1876
15000	Western Andes, s,* New Granada	5 0 0	—		12 per cent. per an.		July 1876
21000	W. Prussian (5500 pref. sh. 10l. paid)	10 0 0	11¼	11 11¼	0 16 0	0 8 0	Sept. 1876

NON-DIVIDEND FOREIGN MINES.

Shares.	Mines.	Paid.	Last Pr.	Clos. Pr.	Last Call.
20000	Anglo-Australian, g, Victoria*	2 10 0	—		Sept. 1872
5000	Anguilla Phosphate, West Indies (4000 issued)	10 0 0	—		Fully pd.
12000	Argentine, g, Argentine Republic	5 0 0	5¼	5 5½	Fully pd.
10000	Australian Central, g* (also 6000 deferred shares)	1 0 0	—		Fully pd.
3000	Bellavista, s, Peru* (£10 shares)	10 0 0	—		Fully pd.
30000	Blue Tent, hyd., California	5 0 0	3¼	3 3¼	Fully pd.
80000	Braganza, g, Brazil*†	0 15 0	—		Oct. 1870
12000	Camp Floyd, s, Utah*	10 0 0	—		Fully pd.
35000	Cesena Sulphur Company, Romanga, Italy*	10 0 0	—		Fully pd.
50152	Chontales, g, s, Nicaragua*†	2 0 0	⅝	⅜ ⅝	Fully pd.
16000	Condes of Chili, s-l	5 0 0	5¼	4¾ 5	Fully pd.
35000	Excelsior Hydraulic Gold Washing Co., California*	6 0 0	—		Dec. 1871
100000	Exchequer, g, s, California*†	1 0 0	1⅞	1½ 1¾	Fully pd.
40000	Holcombe Valley, g,* California	1 0 0	—		July 1873
6000	Hornachos,* s-l, (£10 shares) Spain	10 0 0	13¾	13¼ 13¾	Jan. 1874
20000	Imperial Brazilian Collieries, Brazil*	5 0 0	—		Fully pd.
60000	I. X. L., g, s, California*	1 0 0	1	⅞ 1	Fully pd.
50000	Javali, g, Nicaragua*	2 0 0	⅝	⅜ ½	Fully pd.
3500	La Manche, l, Newfoundland	10 0 0	—		Fully pd.
12000	Lanestosa,* l, z, Viscaya, Spain (£2 shares)	1 15 0	—		Mar. 1876
75000	Malabar, g, Colombia* (67165 issued)	1 0 0	½	⅝ ⅞	Fully pd.
40000	Malpaso, g, Colombia* (7400 pref. shares, fully paid)	1 0 0	¾	⅝ ¾	Fully pd.
12000	Menzenberg, c, Honnef, Germany*	5 5 0	—		Fully pd.
6000	Monte Loreto, g, c, Italy*	5 0 0	—		Fully pd.
4588	New Bensberg, i, l, Germany	5 0 0	par		Nov. 1876
66000	New Quebrada, c, Venezuela*	5 0 0	4¼	4 4¼	Fully pd.
20000	New Zealand Kapanga, g, Coromandel*	5 0 0	3¼	2¾ 3¼	Fully pd.
3000	Oregon,* g, Oregon, U.S. (preference shares)	4 0 0	4¼	4 4¼	Sept. 1875
60000	Panulcillo, c, Chili*† (£80000 debentures)	4 0 0	1½	1¼ 1¾	Fully pd.
60000	Pestarena United, g, Italy*†	3 0 0	⅜	⅛ ¼	Fully pd.
50000	Providencia and New Rosario, s, Mexico*	1 0 0	—		Fully pd.
50000	Rica, g, Colombia* (40000 issued)	1 0.0	¼	⅛ ¼	Fully pd.
£2,181,000	Rio Tinto,* c, Huelva, Spain	Stock	65	63 65	Fully pd.
100000	Rossa Grande, g, Brazil*† (£1 shares)	0 19 0	⅛	⅛	July 1872
30000	Russia Copper, Orenburg and Ufa*†	10 0 0	2½	2 2½	Fully pd.
25000	San Pedro, c, Chili*	2 0 0	1	¾ 1	Fully pd.
10000	Silver Plume, s, Colorado*	1 0 0	—		Fully pd.
37500	Snowdrift, s, Colorado*	2 0 0	—		Fully pd.
30000	Tecoma, s, Utah*	10 0 0	¾	⅜ ⅝	Fully pd.
20000	Thornhill Reef, g, Australia*	1 0 0	—		Fully pd.
43174	United Mexican, s, Mexico*†‡	28 15 3	2¾	2¼ 2¾	May 1875
14000	Utah, g, s-l, Utah*	5 0 0	—		Fully pd.
75000	Yorke Peninsula, c, South Australia	1 0 0	½	¼ ½	Fully pd.
40000	Yorke Peninsula, c, South Australia Preference	1 0 0	1¼	1 1¼	Fully pd.

§ Have made calls since last dividend was paid.

FOREIGN AND MISCELLANEOUS STOCKS, BONDS, LOANS, AND TRUSTS.

	Closing Prices.	
Argentine, 1868, 6 per cent.	67	69
Bolivia, 6 per cent.	18	20
Brazilian, 1865, 5 per cent.	93	95
Chilian, 1866, 7 per cent.	101	104
City of Providence, 5 p.c. coupon bonds	98	100
Egyptian, 1862, 7 per cent.	47½	48½
Do., 1868, 7 per cent.	49	50
Do., 7 per cent., V.M.L.	63	66
Do., 9 per cent. guar.	72	76
Do., 7 per cent., K.M.L.	37½	38½
Foreign and Col. Gov. Trust, 6 p. cent.	67	72
Do., 5 per cent., 2d issue	53	58
Do., 6 per cent., 3d issue	62	67
Do., 1872, 4th issue	55	60
Do., 1873, 5th issue	53	58
Peruvian, 1870, 6 per cent.	17	18
Do. 1872, 5 per cent.	13½	14½
Russian, 5½ per cent. L. Mort.	74	76
Spanish, Quicksilver Mort. 5 p. cent.	93	95
United States Mort., 6 per cent.	73½	74½

NON-DIVIDEND MINES.

Shares.	Mines.	Paid.	Last wk.	Clos. pr.
40000	Aberdaunant, l, Llanidloes*	1 0 0	1⅝	1⅜ 1⅝
10000	Aberystwith,* s-l, Cardigan	5 0 0	—	
7800	Alvig. & Burng.,*t, St. Aust. (3l. sh.)	2 10 0	2⅞	2⅝ 2⅞
18000	Ambrose Lake, t, c, Liskeard	1 18 6	—	
12000	Assheton, l, Carnarvonshire*	5 0 0	1⅝	1½ 2
50000	Ballycummisk,* c, Schull	2 0 0		
12000	Bedford United, c, Tavistock	1 19 6	1	⅝ ⅞
28000	Belstone,* c, Devon (27,000 fy. pd.)	1 0 0	2¾	2¼ 2¾
15000	Blaen United,* s-l, Cardigan	1 0 0	1⅛	⅞ 1⅛
3937	Blue Hills, t, c, St. Agnes	3 7 6	—	
30000	Bodidris,* l, bl, Denbighshire	1 0 0	1¼	1⅛ 1⅜
2000	Bowden Hill,* ma	1 0 0	—	
6000	Bradwell Moss Rake	1 0 0	1⅛	⅞ 1⅛
30000	Caldbeck Fells, l, Cumberland*	2 0 0	—	
15000	Cathedral, t, c, Gwennap*	1 10 0	1½	1 1½
20000	Central Foxdale, l, I. of Man* (2l. sh.)	1 0 0	—	
10000	Central Van,* l, bl, Llanidloes	5 0 0	—	
128	Clementina, l, Llanrwst	20 0 0	40	30 40
7500	Combellack,* t, Wendron	2 0 0	2¼	2 2¼
24000	Court Grange, s-l., Cardiganshire	0 15 0	1⅛	1 1⅛
20000	Cwm Dwyfor,* c, s-l, Carnarvonsh.	0 15 0	—	
3000	Cwmystwith (New) [5l. shares]	4 0 0	—	
512	D'Eresby Mountain, l, bl, Llanrwst	20 0 0	25	20 30
10000	Denbighshire Consolidated, l*	3 0 0	3	2½ 3
12000	Derwent,* l, Durham	4 0 0	4	3½ 4
656	Ding Dong, t, Gulval	51 9 6	4	3½ 4
10000	Dubby Syke, l, Durham*	0 12 6	½	⅜ ½
4000	East Chiverton, l, Perranzabuloe	6 14 6	2½	2 2½
6000	East Goginan, l, Cardigan	2 0 0	2	2
18000	East Van, l, Llanidloes*	5 0 0	7½	7¼ 7¾
20000	Elgar,* s-l, Cardiganshire	1 0 0	1¼	1 1¼
5000	Frank Mills, l, Christow	5 6 0	⅝	½ ⅝
8000	Fronvellan, l, Mont.* [4000 sh. fy. pd.]	1 0 0	—	
3950	Gawton, c, Tavistock	4 3 6	⅝	⅜ ⅝
12000	Glan Clwyd,* l, Gwyddelwern	1 0 0	—	
14000	Glenroy,* s-l, Isle of Man	4 0 0	2	1½ 2
10000	Glyn,* l, Llanidloes	2 0 0	2¼	1⅞ 2⅛
12000	Goginan, & Level Newydd, Card., l	2 10 0	—	
100000	Gold, g, Merionethshire	1 0 0	—	
20000	Goreu,* s-l, Carmarthen	1 0 0	1¼	1⅛ 1¼
7500	Gorsedd and Merllyn Cons., l, Flint	2 10 0	5	5 5½
20000	Gt. E. Foxdale, l, I. of Man (1l. sh)	0 15 0	—	
9500	Great Pant-y-Pydew, l, Holywell	2 0 0	—	
6000	Gt. Wheal Eleanor, t, North Bovey.	1 0 0	3	2 3
18000	Grosvenor, l, Holywell (£1 sh.)	0 15 0	—	
10000	Harehope Gill,* l, Durham (£1 sh.)	0 5 0	1	¾ 1
6400	Harwood,* l, Durham	0 15 0	1	¾ 1
5000	Hush Eisteddfod Minera,* l	2 0 0	—	
200	Islay,* l, Scotland	28 0 0	—	
6000	Killifreth, t, Chacewater	1 18 0	1⅛	1 1⅛
25000	Kingston Con., s-l, Stoke Climsland.	1 0 0	—	
12000	Ladywell,* l, Salop	2 10 0	1¼	1 1¼
12000	Ditto, 10 per cent. pref., 1l. each	0 5 0	⅜	¼ ⅜
20000	Leadhills,* l, Lanarkshire	6 0 0	6½	6¼ 6½
2500	Levant, c, t, St. Just	9 6 6	—	
25000	Llanrhaiadr, l, Montgomery*	2 0 0	—	
30000	Llanrwst,* l, Carnarvon	2 0 0	3¼	3⅛ 3¼
15000	Llwyn Teify,* s l, Cardigan	1 0 0	—	
6000	Medlyn Moor, t, Wendron	1 17 4	2	2
10000	Mellanear Copper, Hayle*	1 0 0	—	
11000	Monydd Gorddu, l, Cardigan* (Red.)	5 0 0	4	3½ 4
12000	Mount's Bay, c, Marazion	1 0 0	—	
25000	Nant-y-Ronen, s-l, Cardigan*	1 0 0	—	
15000	Nascent Copper*	1 0 0	—	
12000	Neptune,* c, Perranuthnoe	0 5 0	—	
10000	New Beldon, l, Northumberland*	1 0 0	—	
3000	New Chiverton,* l, Perranzabuloe	6 0 0	6½	6¼ 6½
20000	New Consols, s, a, Stoke Climsland*	3 0 0	1¼	1 1¼
8000	New Dolcoath, t, c, Camborne*	3 0 0	1¼	1⅛ 1¼
20000	New East Foxdale, s-l, Isle of Man.	0 15 0	—	
16000	New Fowey Consols, t, St. Blazey*.	3 0 0	2	1½ 2
1492	New Hendra, t, Breage	2 19 0	1¼	1⅛ 1¼
10000	New North Pool,* c, Illogan	3 0 0	2	1½ 2
5000	New St. Agnes,* t, St. Agnes	5 0 0	5¼	5 5¼
3200	New South Merllyn, l, Flint*	2 10 0	2	1½ 2
4000	North Cornwall, l, Cornwall	5 0 0	5¼	5 5¼
17000	North Laxey,* Isle of Man	2 0 0	⅞	¾ ⅞
20000	North Prince Patrick,* l, Holywell.	1 0 0	1⅛	1 1⅛
1000	North Rosewarne, c, Gwinear	6 2 6	—	
5936	North Treskerby, c, St. Agnes	3 17 10	—	
2000	North Wheal Towan, t, c, Illogan	1 19 6	—	
6000	Old Talargoch, l, Flintshire*	2 0 0	—	
2500	Old Tincroft, c, t, Lelant*	4 0 0	4	3 4
6400	Oola Hills,* s-l, Limerick	5 0 0	—	
12000	Pandora,* l, Carnarvon	2 0 0	2½	2 2½
16923	Parys Mountain,* c, Anglesea	3 0 0	⅝	⅜ ½
4000	Pateley Bridge, l, Yorkshire	5 0 0	3	2½ 3
6000	Pedn-an-drea Consols, t, Redruth	5 0 0	6	6¾ 7
6000	Pennant, l, bar, North Wales*	5 0 0	6	5½ 6
12000	Pennerley, l, Shropshire*	2 0 0	⅞	¾ ⅞
12000	Plynlimmon, l, Llanidloes*	2 0 0	⅜	¼ ⅜
648	Polrose, t, Breage	21 0 0	—	
10000	Port Nigel,* s-l, Carnarvonshire	2 0 0	2½	2 2½
2000	Prideaux Wood, t, Llanivery	5 0 0	—	
12800	Prince of Wales, c, Calstock‡	1 19 6	¼	⅛ ¼
10000	Red Rock,* l, Cardigan	2 0 0	2¾	2¼ 2¾
6000	Relistian Consols, c, Gwinear	0 10 0	¾	½ ¾
15000	Rookhope, l, Durham*	1 10 0	1	⅞ 1
3000	Russell, s-l, Swymbridge	0 6 0	—	
5000	Silvercross,* c, t, Marazion	1 0 0	¾	½ ¾
4200	Snowbrook, s-l, Montgomery	5 0 0	5¼	5⅛ 5¼
5000	South Carn Brea, c, t, Illogan	3 10 0	¼	⅛ ¼
6000	So. Cwmystwith, l, Cardiganshire	2 0 0	4	3½ 4
6000	South Darren, l, Cardigan*	1 10 0	—	
512	South Dolcoath, c, t, Redruth	12 5 0	1⅛	1 1⅛
18000	South Roman Gravels, l*	1 10 0	1	¾ 1
6000	South Roskear, t, c, Camborne	6 10 0	5	4 5
6000	South Tolcarne, t, c, Camborne	1 9 0	¾	½ ¾
937	South Wheal Crofty, c, Illogan	36 10 10	18	15 16
4500	South Wh. Frances, c, Illogan†	7 4 4	1	⅞ 1
432	Spearn Moor, t, Penzance‡	46 17 9	—	
6000	St. Lawrence, Amal., l, Flintshire*	2 0 0	—	
10000	St. Patrick, l, Halkin, Holywell*	1 0 0	1½	1¼ 1½
6000	Success, &c., l, Derb. (12,000l. called)	1 0 0	—	
16000	Sunnyside,* l, Durham	2 0 0	2½	2 2½
30000	Talybont,* s-l, Talybont	1 0 0	—	
6400	Teesdale,* l, Durham	1 0 0	1	1
14000	Teign Valley, l, bar., Bridford	1 0 0	—	
10000	Temple, l, Cardigan*	1 0 0	2½	2 2¼
12000	Trebeigh Consols, s-l, St. Ive	0 7 6	⅜	⅜ ½
5000	Treleigh Wood, t, Redruth	5 16 0	—	
547	Treiyon Consols	15 0 0	⅝	½ ⅝
12000	Trethellan, s-l, Crantock*	2 0 0	—	
2561	Trumpet Consols, t, Helston§	10 0 0	—	
640	Truro*, l, Nerquis, Flintshire	10 0 0	10	10
25000	Unity Wood, t, c, Kenwyn	4 5 6	⅝	½ ⅝
20000	Van Consols, l, Llanidloes*	2 10 0	2⅝	2⅞ 3⅛
12000	West Assheton, l, Carnarvon	1 0 0	1¼	¾ 1¼
6000	West Basset, c, Illogan†‡	5 6 8	4	3½ 4
20000	West Bryn Celyn,* l, Flintshire	1 0 0	—	
12500	West Combmartin, s-l, North Devon	1 0 0	1⅜	1 1⅜
3000	W. Craven Moor, l, Pateley Bridge*	10 0 0	13¼	12½ 13½
5000	West Godolphin, t, c, Breage	1 16 0	3¼	2½ 3
12000	West Goginan,* Cardiganshire	2 0 0	¾	½ ¾
15000	West Great Work, t, Breage*	2 0 0	2¼	2⅛ 2¼
10000	West Llangynog, s-l, Montgomery	2 0 0	—	
12000	W. Maria & Fortescue, t, c, Lamer.	4 14 0	⅜	¼ ⅜
3000	West Mary Ann, l, Menheniot	0 3 6	¼	⅛ ¼
50000	West Minwr, s-l, Flint	1 0 0	—	
12000	West Pant-y-Go, s-l, Flint*	1 0 0	—	
20000	West Pateley Bridge, l, Yorkshire	1 0 0	1¼	1 1¼
10000	West Roskear, t, s-l, bl, c, Camborne	0 12 0	3	2½ 3
15000	W. Tankerv*, l. (in 3000s .15p.c.pref.)	3 0 0	1⅞	1½ 1¾
15000	West Treasvean,* c, t, Gwennap	1 0 0	1¼	1 1¼
8000	West Wheal Peevor, t, Redruth	0 10 0	2¾	2½ 2¾
600	West Wheal Seton, c, Camborne†	47 0 0	35	27½ 32½
6000	Wheal Agar, c, Illogan	11 10 0	3¾	3½ 3¾
6000	Wheal Argus, t, Sancreed	0 10 0	—	
741	Wheal Basset and Grylls, t	9 18 6	—	
6000	Wheal Coates, t, St. Agnes	2 0 0	2	1½ 2
6000	Wheal Crebor, c, Tavistock	4 1 0	3¼	2¾ 3
8400	Wheal Emma, t, c, Buckfastleigh	1 10 0	—	
50	Wheal Fowey and East Eliza, t	100 0 0	110	100 110
5178	Wheal Grenville, c, Camborne*	2 8 6	⅞	⅝ ⅞
12000	Wh. Mary Hutchings,* t, Plympton	1 14 0	—	
25000	Wheal Newton, a, c, s, t, Callington*	1 0 0	2¼	2 2¼
3000	Wheal Peevor, t, Redruth	6 7 6	4½	4¼ 4¾
12000	Wheal Russell, c, Tavistock	2 0 6	⅜	¼ ⅜
4048	Wheal Uny, t, c, Redruth	13 6 6	1¾	1¾ 2
480	White Cliff,* l, Llanrwst	4 0 0	4	4

b, blende; cl, coal; c, copper; g, gold; l, lead; s, silver; sl, slate; s-l, silver-lead; t, tin; z, zinc.

* Limited Liability Companies; † quoted on the Stock Exchange; ‡ have paid dividends.

IRON AND COAL COMPANIES.

Shares.	Company.	Paid.	Prices.
£100	Abbot, John, and Co. [L.]	£75 0 0	1¼
15	Albion Steel and Wire Co. [L.]	14 0 0	15
5	Alltami Colliery Co. [L.]	5 0 0	par
100	Ashbury Co. [L.]	90 0 0	40
10	Bagnall, John, and Sons [L.]	10 0 0	
10	Benhar Coal Co. [L.]	10 0 0	6
50	Bilbao Iron Ore Co. [L.]	50 0 0	¼ dis.
10	Bilson & Crump Meadow Coll. Co. [L.]	10 0 0	23½
4	Blaen Cwmbach Coal Co. [L.]	4 0 0	—
50	Blaenavon Iron and Steel Co. [L.]	50 0 0	—
100	Bolckow, Vaughan, and Co. [L.]...A	45 0 0	—
50	Bowling Iron Co. [L.]	50 0 0	7¼
50	Britannia Ironworks [L.]	25 0 0	—
50	Brown, Bailey, and Dixon [L.]	40 0 0	—
100	Brown, John, and Co. [L.]	70 0 0	18¼
5	Cakemore Colliery Co. [L.]	5 0 0	¼ dis.
100	Cammell and Co. [L.]	80 0 0	—
20	Cannock and Huntington Coal [L.]	2 0 0	3
10	Cardiff & Swansea St. Coal Co. [L.]	8 0 0	—
10	Cardigan Steel and Wire Co. [L.]	8 10 0	—
10	Central Swedish Iron and Steel [L.]	10 0 0	—
5	Chapel House Colliery	5 0 0	1
50	Charlton Iron Co. [L.]	50 0 0	2¾
50	Chatterley Iron Co. [L.]	45 0 0	12
10	Chillington Iron Co. [L.]	10 0 0	24
1	Clee Hill Colliery Co. [L.]	1 0 0	6⅝
10	Consett Iron Co. [L.]	7 10 0	10¼
1	Consett Spanish Ore [L.]	1 0 0	⅛ dis.
50	Cooke, William, and Co. [L.]	40 0 0	33
20	Darlington Iron Co. [L.]	10 0 0	9¼
50	Davy Brothers [L.]	22 10 0	9¾
5	Diamond Fuel Co. [L.]	5 0 0	⅜
32	Ebbw Vale Co. [L.]	29 0 0	21
100	Fox, Samuel, and Co. [L.]	80 0 0	35
10	General Mining Ass. [L.] (£1 returned)	9 0 0	3⅜
20	Great Western Coal Co. [L.]	17 0 0	
2	Gwyngwillim Colliery Co. [L.]	2 0 0	—
15	Hopkins, Gilkes, and Co. [L.]	11 0 0	7½
50	Knowles, Andrew, and Sons [L.]	17 0 0	⅜
10	Llay Hall Coal, Iron, & Firebrick [L.]	10 0 0	10
5	Littledean Woodside Coll. Co. [L.]	5 0 0	
50	Llynvi, Ogmore, & Tondu Co. [L.]	50 0 0	35
10	Lydney and Wigpool Iron Ore [L.]	8 5 0	10
10	Marbella Iron Ore Co. [L.]	10 0 0	7¼
6	Mersey Steel and Iron Co. [L.]	5 0 0	10
10	Midland Iron Co. [L.]	5 0 0	
5	Mold Argoed Colliery Co. [L.]	5 0 0	⅜
10	Monkland Iron and Coal Co. [L.]	10 0 0	7⅛
4	Mwyndy Iron Ore [L.]	3 10 0	2
100	Nant-y-Glo and Blaina (8 p.c. pref.)	100 0 0	20
1	Nerbudda Coal and Iron	0 8 0	¼ dis.
20	New Sharlston Collieries [L.] Pref.	20 0 0	16
10	Newport Abercarn Coal Co. [L.]	10 0 0	6¼
10	Northmptn. Coal, Iron & Wagon [L.]	8 0 0	
10	Northfield Iron Co. [L.]	8 0 0	2½
1	Norton Green Coal Co. [L.]	1 0 0	
35	Palmer's Shipbuilding and Iron [L.]	25 0 0	16
100	Parkgate Iron Co. [L.]	65 0 0	3 dis.
20	Patent Nut and Bolt Co. [L.]	14 0 0	7
20	Patent Shaft and Axletree [L.]	10 0 0	
20	Pelsall Coal and Iron [L.]	15 0 0	9
50	Phœnix Bessemer Co. [L.]	40 0 0	
50	Rhymney Iron Co. [L.]	50 0 0	21
10	Richards and Co. [L.]	10 0 0	7
100	Sandwell Park Colliery Co. [L.]	100 0 0	
50	Ditto New	10 0 0	
100	Shotts Iron Co. [L.]	100 0 0	par
100	Sheepbridge Iron and Coal [L.]	55 0 0	5⅛
50	Silkstone & Dodworth Cl. & Iron [L.]	27 0 0	10
20	Skerne Ironworks [L.]	20 0 0	13½
50	Somorrostro Iron Co. [L.]	50 0 0	10
20	South Wales Coal Co. [L.]	17 0 0	
100	Staveley Iron and Coal Co. [L.]	60 0 0	30
100	Ditto ditto New	10 0 0	5
20	South Cleveland Ironworks [L.]	20 0 0	
10	Swansea Valley Steam Coll. Co. [L.]	6 0 0	
100	Thames Iron Company	100 0 0	
50	Tredegar Iron and Coal Co. [L.]	12 0 0	5
25	Ditto B. shares	25 0 0	2
20	Ulverston Mining Co. [L.]	12 0 0	1¾
1	United Bituminous Collieries [L.]	1 0 0	
10	Vancouver Coal [L.]	6 0 0	par
100	Vickers, Sons, & Co. [L.]	100 0 0	35
50	Welsh Ironworks Co. [L.]	50 0 0	
25	W. Cumberland I. and Steel [L.]	20 0 0	10
10	West Mostyn Coal [L.] (12 p.c. pref.)	5 0 0	
5	West Swansea Colliery Co. [L.]	5 0 0	
10	Whitehaven Iron Co. [L.]	10 0 0	
100	Wigan and Whiston Coal Co. [L.]	70 0 0	
100	Wigan Coal and Iron Co. [L.]	75 0 0	

WAGON COMPANIES.

Shares.	Company.	Paid.	Prices.
10	Birmingham Wagon Co. [L.]	10 0 0	22
20	British Wagon Co. [L.]	10 0 0	2¼
20	Sheffield Wagon Co. [L.]	15 0 0	3¼
10	Yorkshire Wagon Co. [L.]	10 0 0	4⅛

TELEGRAPH COMPANIES.

Shares.	Company.	Paid.	Prices.
"St."	Anglo-American	100 0 0	51¼
10	Brazilian Submarine	10 0 0	6¼
20	Direct United States Cable	20 0 0	10¼
10	Eastern	10 0 0	6⅞
10	East. Exten., Australia and China	10 0 0	6⅞
10	Great Northern	10 0 0	7¼
25	Indo-European	25 0 0	18½
10	Mediterranean Extension	10 0 0	2¼
8	Reuters	8 0 0	12
Stk.	Submarine	100 0 0	220
10	West India and Panama	10 0 0	2½
20	Western and Brazilian	20 0 0	4¼
$1000	Western Union, 7 per cent. Mort. Bonds	$1000	109 111

MISCELLANEOUS.

Shares.	Company.	Paid.	Prices.
Stk.	Atlantic and Great Western Leased Lines, Rental Trust	100 0 0	40
25	Austral. Mort. Land and Finance [L.]	5 0 0	4
25	Australian Agricultural	21 10 0	95
10	Avonside Engine [L.]	7 0 0	4
Stk.	Baltimore and Ohio, 6 per cent.	100 0 0	109 110
Stk.	Cent. of New Jersey Con. Mort.	100 0 0	53
Stk.	Cent. Pacific of Calif., 1st Mort. 6 p.c.	100 0 0	103 104
25	City of London Real Property [L.]	12 0 0	⅛
25	Copper Miners of Eng. (7 p. c. pref.)	25 0 0	
5	Credit Foncier of England [L.]	5 0 0	1⅜
5	Diamond Rock Boring	4 10 0	1⅛
15	English and Foreign Credit	8 0 0	
16	Fore Street Warehouse [L.]	14 0 0	14½
15	Foster, Porter, and Co. [L.]	10 10 0	11
5	Gen. Phos. & Chem. Works Co. [L.]	5 0 0	
1	Glaisdale Whinstone Quarry	1 0 0	
17	Hudson's Bay Company	17 0 0	13
10	Huntington Copper and Sul. Co.	9 0 0	8½
Stk.	Illinois Central, $100 shares	100 0 0	50
Stk.	Illinois & St. Louis Bridge, 1st Mort.	100 0 0	96
Stk.	Ditto, 2nd Mort., 7 per cent.	100 0 0	58
Stk.	Illinois Cent. Sinking Fund, 5 p. cent.	100 0 0	97
Stk.	Ditto, 6 per cent.	100 0 0	101
7½	Imperial Credit [L.]	7 10 0	7⅜
—	Ditto, Surplus Certificate	—	5
Stk.	Lehigh Val. Con. Mort., A, 6. p. cent.	100 0 0	96
10	Milner's Safe [L.]	10 0 0	9¾
25	National Discount [L.]	5 0 0	10
Stk.	N. Cent. Rail. Con. Mort., 6 per cent.	10 0 0	84
5	Patent Gunpowder Company	0 0	4⅛
10	Pawson and Co. [L.]	0 0	¼ dis.
50	Peninsular and Oriental Steam	50 0 0	38
Stk.	Pennsyl. Gen. Mort. 6 p. cent., 1910	100 0 0	105½
Stk.	Ditto, Con. Sink. Fund, 6 p. ct., 1905	100 0 0	95½
Stk.	Scottish Aust. Investment Company	100 0 0	180
Stk.	Ditto, 6 per cent. Preference	100 0 0	121
10	Silber Light (ord. sh.)	10 0 0	
20	Suez Canal shares	20 0 0	
12	Telegraph Construc. & Mainte. [L.]	12 0 0	26½
5	Ditto, Second Bonus Three per Cents	5 0 0	2½
10	Tharsis Sulphur and Copper Co.	10 0 0	20
Stk.	Union Pacific Land Grant, 1st Mort.	100 0 0	100
Stk.	Union Pacific Railway, 1st Mort.	100 0 0	101

London: Printed by RICHARD MIDDLETON, and published by HENRY ENGLISH (the proprietors), at their office, 26, F[illegible] STREET, E.C., where all communications are requested [illegible] addressed.—March 10, 1877.